COAL AGE

The Weekly Journal of the Coal and Coke Industries

Volume 17 NEW YORK, THURSDAY, APRIL 29, 1920 Number 18

Coal Miners Should Help the Farmer

SECRETARY MEREDITH of the Department of Agriculture has issued an appeal to city men, college students and others to spend their vacations working on farms, particularly as helpers in harvest fields. He states that shortage of hired farm labor is as acute as in 1918 and the labor situation on farms threatens to curtail food production. Herbert Hoover in a recent published article drew particular attention to the growing disparity between the growth of our industrial and rural populations and prophesied that if labor continues to abandon the farm for the factory, we will become a food-importing nation.

In years of slack demand for coal there is a steady movement of coal-mine labor from the mines to the farms in a number of important centers. This year, however, with the prospect of all the work at the mines for which cars can be had, and with the recent considerable increase in wages of miners, the farms may not see as many miners as, for instance, last summer. If the farms can offer the inducement to labor to attract them from the mines, the country will be better off, for more food will be produced and no less coal will be mined.

Buy-Late Campaign Needed This Year

HOW generally does the public at large realize the speed at which we are drifting into a serious condition of coal supply? Prosperous industry and cold weather combined to make the demand for coal exceptionally strong last winter. The miners' strike cost us 40,000,000 tons of output; storms blocked traffic and prevented the mines and railroads from making up the loss even in small degree and now the "outlaw" railroad strike is having a serious effect on production.

According to the Geological Survey production of bituminous coal during the week of April 17 was 7,668,000 tons, compared with 7,411,000 the same week a year ago. The total production January to date is 157,797,000 tons, somewhat below the figures established in the war years 1917 and 1918, but well above the 126,141,000 tons in the same period of last year.

These production figures however, do not tell the whole story. Last year at this time the country was still burning coal from storage piles accumulated before the armistice. The railroads had abundant stocks, the lake docks were carrying coal over from 1918, and exports overseas were limited by ship shortage. There was on every side utter indifference to coal.

Today consumers' stocks are low or gone, the railroads have just been forced to resort to assigned cars to get coal for current use, the upper Lake docks are bare, with the trade talking about 30,000,000 tons up Lakes this season, and offshore exports are gaining in volume every month.

The situation has its serious aspects because for months to come consumers will not be able to get as much coal as they demand. If for 1920 total requirements plus exports greatly exceed 500,000,000 tons we are going to be short of coal. Prices of bituminous coal are advancing and the one certainty is that they will not soon come down.

Last year the consumer could help by buying and storing coal; this year he can help only by staying out of the market except for necessary requirements.

Let us have clearly in mind that the remedies to stabilize coal industry proposed by Senator Frelinghuysen, the American Institute of Mining Engineers and others, really are for the purpose of equalizing demand. No treatment is needed this summer to boost demand. In considering the arguments pro and con on seasonal rates, storage and stabilization generally, think in terms of 1919 conditions that may possibly be repeated in 1921 or 1922. No need to stabilize the industry this summer; rather should producers and consumers bend all their efforts toward steadying the market.

College Graduates for Miners Promise Solution of Labor Problems

MACHINES to take the place of men is the constant aim of our engineers. This country's preeminence in industry is due to our ability to make the work of a man go farther than in other countries. The high average annual per capita consumption of coal here compared with European nations is often taken as an index of this very fact.

Compared with manufacturing, mining has been backward in this regard, and in the mineral industries, coal, with its greater opportunities still has a vast field to explore. Although several decades have passed since the first coal-mining machine was used, but little more than half of our coal is undercut by machine. Undercutting the coal, however, is only one operation in the getting. Two machine runners can now keep from eight to ten loaders busy with hand shovels.

When machines to cut and load coal are perfected the miner will be supplanted by the expert mechanic. Two, three or four highly trained men will do the work for which from twelve to twenty are now required. The wages that operators can afford to pay such men will attract the best there are, and some observant and far-sighted mine managers are looking forward to employing young graduates of mechanical engineering colleges in their mines. The reasons prompting such a selection are obvious.

A class of men above the average, less liable to radical labor influence, seeking advancement through individual effort rather than through organization, which holds all down to the level of the less able, is the aim of the future. College-trained mechanics will always tend to further perfect their machines. Prac-

tice will supplement theory with these miners of the future, and the progress of the industry will be even faster than now. Perhaps the day is not far distant when Paddy the miner will send his son to college to learn his trade, instead of taking him to the face.

Improvement Through Borrowed Lenses

MOST machines today embody a long series of separate improvements and adaptations. In some instances improvement has been carried so far that the fundamental or original idea has been largely if not entirely lost. Thus, it is a far cry from the fire-spitting bamboo tube employed in Chinese pyrotechnics to the modern high-power rifle, yet the two are linked together by a long and complete chain of evolution. In such an extended series of developments ideas spring from their own primordial elements or they may be borrowed from any source whatsoever.

A large manufacturing company has built a new design of electric mine locomotive that embodies at least two details of construction apparently borrowed and adapted from the automobile industry. These are the method of spring mounting intended to secure equal wheel pressure and the detachable tire. One of these refinements will reduce the frequency of derailments and the other will make it easy and rapid to renew worn tires.

It matters little to the operator who buys and uses mine equipment from what source the designer received his inspiration or from what corner of the universe or what age of civilization he got his idea so long as the detail worked out in a real improvement upon existing practice.

Any mining man who has almost broken his neck and possibly one or two of the commandments in trying to lift on a mine car after it had derailed simply because no provision had been made in its design to compensate for inequalities in the track or any small permanent "set" taken by the car frame or box as the result of a wreck or collision, can appreciate the advantage of a "motor" that will safely traverse such track inequalities.

Low-Temperature Coal Distillation in Germany

We print on page 850 a short article entitled "Coal, a Hardened Petroleum." This sets forth that two German experimenters by trials conducted during the war were enabled to secure by means of low-temperature distillation of coal all of the products usually obtained in the refining of petroleum. Thus in addition to the gas, coke and ammonia compounds ordinarily secured these men were able to produce gasoline, lubricating oils, paraffin and a tar differing somewhat in composition from that normally obtained from the so-called destructive or high-temperature distillation of coal in the ordinary byproduct oven.

Unfortunately the article referred to does not go into any detail whatsoever and give the quantity of each product secured per ton of coal coked. It is at least interesting, however, to know that, as the writer of the article phrases it, coal is "in a sense hardened petroleum."

The results secured by these German experimenters closely parallel those obtained in this country by the Greene-Laucks and other processes of low-temperature distillation. American experimenters, however, while possibly slightly less successful in the segregation of light or volatile oils, have apparently attained a greater degree of efficiency in coke production. The securing of a commercial solid residue (coke) is claimed by American operators to be among the least of their troubles, while it is stated that the structure of the German product is so defective as to require additional treatment and to form at the present time one of the problems of the process as yet unsolved.

That we in America burn our coal raw, wasting all of the byproducts contained, has long been regrettable. The time may come, and possibly at no remote date, when we will no more think of burning freshly-mined coal than we will think of eating raw, whole wheat or corn. Most coals produced in this country can be improved as fuels—weight for weight of raw and treated products—by low-temperature distillation. This process of treatment, provided it can be perfected and economically applied upon a commercial scale, will be highly interesting to the general public, since it bids fair to bolster up the decreasing supply and in a measure appease the constantly increasing demand for that all but universally used propulsive fuel, "gas."

In somewhat lighter vein it appears well within the range of possibility that future advertisements of fuel may display prominently a legend that has already become familiar to straphangers and others who make pilgrimages by street car or interurban, namely, "It's toasted."

Trade Commission Renews the Demand for Cost Reports

On April 26 the Federal Trade Commission announced the following policy in connection with its monthly reports:

"The Commission has received numerous inquiries recently as to whether, in view of the recent decision in the Maynard Coal Co. case, it would continue to require monthly reports from coal mining companies. The Commission believes that this information is useful and important.

"To the general public and also to the coal operators, it seems that a large number of the operators realize this situation. Therefore, the Commission will continue to require these reports, except from the Maynard Coal Co., in the manner provided by the Federal Trade Commission Act, until the appeal in the Maynard Coal Co. case is decided by the U. S. Supreme Court."

The order recently made by the District of Columbia Supreme Court in respect to the Maynard Coal Co. put that company under bond to pay the penalties provided for by law in the event the final decision should be in favor of the Commission, and meantime the Commission is restrained only from proceeding against that company.

World Production of Coal in 1919 Fell to Level of 1910

Compared with 1913, Decrease of Output in United Kingdom and Belgium Was 20 Per Cent, in Germany 40 Per Cent—Reduction in French Production Was Due to Destruction of Mines by Germans

WORLD production of coal in 1919 seems to have dropped back to the level of 1910. Preliminary estimates, necessarily rough, place the total output of all kinds of coal in 1919 at 1,170,000,000 metric tons, or 1,290,000,000 net tons. This is 162,000,000 metric tons less than the production in 1918, the last year of the World War, and about 171,000,000 tons less than that of 1913, the year before the war began.

THE WORLD'S PRODUCTION OF COAL, 1910-1919
(Metric tons of 2,205 Pounds)

Year	Production (in Part Estimated)	Per Cent Produced by United States
1910	1,160,000,000	39.2
1911	1,189,000,000	37.9
1912	1,249,000,000	38.8
1913	1,341,000,000	38.5
1914	1,208,000,000	38.5
1915	1,190,000,000	40.5
1916	1,270,000,000	42.1
1917	1,336,000,000	44.2
1918	1,332,000,000	46.2
1919	1,170,000,000	42.1

This estimate is based by F. G. Tryon, of the Geological Survey, upon reports to the Supreme Economic Council from countries which contribute about 85 per cent of the world's output. Obviously, returns from the other countries may materially alter this figure; if anything, they probably will reduce it still further.

The above table shows the estimated production of the world for each year from 1910 to 1919. Because of disturbances and interruptions in the compilations of Government statistics, particularly in central and eastern Europe, the figures since 1913 are not to be regarded as final. The metric ton of 2,205 lb. is used because it is the prevailing unit in non-English speaking countries.

It is pointed out by the Supreme Economic Council that from 1913 to 1919 the output of bituminous coal in the four European countries shown in the table has fallen from 532 millions to 386 millions, the decrease being about 20 per cent in the United Kingdom and Belgium, and nearly 40 per cent in Germany. In the Saar Valley, whose output appears to have fallen from 12 million tons in 1913 to about 8 millions in 1919, the percentage of decrease was over 30. The reduction in the French output is mainly due to the destruction of the mines in the Nord and Pas de Calais.

The output of lignite in Germany in 1919, though less than in 1918, was still greater than before the war, being 94 million tons, as compared with 87 millions in 1913.

In the break-up of Austria-Hungary the bulk of that country's coal and lignite, the production of which amounted before the war to about 55,000,000 tons, was inherited by the Republic of Czecho-Slovakia. The 1919 production of Czecho-Slovakia was about one-third less than the same territory produced in 1913.

Comparative production in millions of metric tons in five of the belligerent countries before and after the war is shown in the following table:

	1913	1919
United Kingdom	292	237
France (present boundaries) *a*	44	22
Belgium	23	18
Germany (present boundaries) *b*		
Bituminous	173	109
Lignite	87	94
United States	517	494

a Includes Alsace-Lorraine. *b* Excludes Alsace-Lorraine and the Saar.

PRODUCTION OF COAL IN THE UNITED STATES AND CERTAIN EUROPEAN COUNTRIES, BY MONTHS 1919, AND ANNUAL MONTHLY AVERAGES 1913-1919 *a*
In metric tons of 2,205 pounds.

Period	United States (all coal)	United Kingdom (all coal)	France *b*	Belgium	Netherlands		Germany *c* (excluding lignite)
					Coal	Lignite	
Monthly average							
1913	43,089,000	24,336,000	3,404,000	1,904,000	159,000	.....	14,383,000
1914	38,822,000	22,493,000	2,482,000	1,393,000	165,000	.....	12,331,000
1915	40,190,000	21,439,000	1,686,000	1,182,000	194,000	.....	11,340,000
1916	44,611,000	21,707,000	1,790,000	1,405,000	221,000	.....	12,281,000
1917	49,245,000	21,039,000	2,411,000	1,244,000	261,000	.....	12,822,000
1918	51,272,000	19,282,000	2,078,000	1,152,000	296,000	119,000	12,301,000
1919	41,145,000	19,731,000	1,869,000	1,533,000	294,000	152,000	9,049,000
1919 January	44,577,000	19,855,000	2,473,000	1,233,000	298,000	221,000	8,832,000
February	33,165,000	19,700,000	2,284,000	1,269,000	270,000	145,000	8,389,000
March	35,197,000	20,515,000	2,125,000	1,426,000	294,000	237,000	9,299,000
April	35,290,000	19,273,000	1,745,000	1,494,000	281,000	244,000	5,091,000
May	40,743,000	22,048,000	1,733,000	1,572,000	299,000	165,000	8,772,000
June	40,187,000	18,526,000	858,000	1,456,000	721,000	112,000	8,312,000
July	45,814,000	17,861,000	1,430,000	1,659,000	317,000	86,000	9,988,000
August	46,090,000	16,174,000	1,787,000	1,573,000	294,000	145,000	8,907,000
September	49,655,000	19,192,000	1,838,000	1,685,000	290,000	141,000	9,962,000
October	58,697,000	19,687,000	2,265,000	1,885,000	318,000	114,000	10,358,000
November	23,940,000	20,110,000	1,820,000	1,692,000	290,000	86,000	10,217,000
December	40,394,000	20,257,000	2,066,000	1,449,000	311,000	128,000	10,458,000
1920 January	50,852,000	21,685,000	.....	.....	320,000	128,000	.....

a Figures from the Monthly Bulletin of Statistics of the Supreme Economic Council for February, 1920, except that figures for the United States are corrected and those for the United Kingdom in 1919 are converted from a weekly to a monthly basis.
b Includes output of Alsace-Lorraine in 1919.
c Includes bituminous output of the Ruhr, Upper and Lower Silesia, Saxony, and Aachen districts. Excludes the Saar and Alsace-Lorraine. In addition Germany has a large production of lignite which amounted in 1919 to nearly 8,000,000 tons per month.

Supreme Court Dissolves Reading Company

Separation of Coal and Railroad Companies Not Expected To Have Important Effect on Anthracite Coal Situation

BY A four to three opinion the U. S. Supreme Court on April 26 sustained the Government's charges of illegal combination against the Reading Company because of its holdings in various coal companies and in other roads. The combination was held to be a violation of the Sherman anti-trust act and was ordered to be dissolved.

The decision reversed Federal Court decrees rendered in Philadelphia in 1915 refusing to sustain the Government's charges of monopoly, but directing the separation of the Central Railroad of New Jersey from its subsidiary, the Lehigh and Wilkes-Barre Coal Co.

The court's opinion was delivered by Justice Clarke. Chief Justice White and Justices Holmes and Van Devanter dissented from the majority opinion, stating that their views coincided with those of the three judges of the lower court. Justices McReynolds and Brandeis took no part in the decision. Justice McReynolds was Attorney General during the time the Government prosecuted the suit, which was instituted in 1913.

The decision came on appeals by the Government and a cross-appeal by the Reading Company, the ruling of the lower court being unsatisfactory to both parties.

Dissolution was ordered of the combination of the Reading Co., the Philadelphia & Reading Railway Co., the Philadelphia & Reading Coal & Iron Co., the Central Railroad of New Jersey and the Lehigh and Wilkes-Barre Coal Co., so that they would be entirely independent of each other. Disposition of the stock and bonds of the companies held by the Reading Co. also was directed.

The court, however, sustained lower court decrees absolving the Lehigh Coal and Navigation Co., the Lehigh & New England Railroad Co. and the Lehigh & Hudson River Railway Co. on charges as to restrictive covenants in mining lease with respect to the shipping of coal and refusing to order the dissociation of the Philadelphia & Reading Coal & Iron Co. and the Lehigh and Wilkes-Barre Coal Co. maintained through the holding company.

Charges against the directors of the holding company, who also were named as defendants, were dismissed. Most of them have died since the suit was instituted and their successors in office were not made parties to the suit.

Injunctions restraining enforcement of provisions inserted by the Reading and Wilkes-Barre coal companies in coal leases, requiring the lessee to ship all coal mined by designated rail routes, were made permanent, the court condemning such provisions as unlawful.

The action grew out of the financial reorganization of the Reading and associated lines in 1896. The suit was filed by the Department of Justice, charging a number of railroad and coal companies with restraining and monopolizing the trade of coal. It was filed against the Reading Company and others, known as the anthracite coal combination, on Sept. 2, 1913.

The case was argued in the Supreme Court in October, 1916; restored to the docket for reargument in May, 1917; reargued in November, 1917; restored to the docket for reargument in June, 1918, and in October, 1918, was continued at the request of the Government on account of war conditions.

While the decision seems to be a complete victory for the Government, the court emphatically denouncing the combination of the railroads and the coal companies and declaring that the great power obtained had been used to restrain commerce, the opinion held by legal authorities in Washington is that the effect of the ruling will be to cause the companies affected to do by contract what they have been doing by co-ordination. As a consequence they expect no important net result.

British Mine Workers Accept a 20-Per Cent Increase

AFTER making large demands the members of the Miners' Federation of Great Britain agreed April 15 to accept the Government offer of a 20-per cent increase on gross earnings. As the Miners' Federation rules require a two-thirds majority before a strike can be authorized, it was not expected that any such further misfortune would be visited at this time on the United Kingdom.

Fortunately, not only did the men not vote to strike but they voted by an ample majority of 65,135 in favor of acceptance of the wage offered.

The increase in wage will add £36,000,000 to the mine workers' payrolls, 900,000 men participating in the benefit. The mine workers hoped for a wage which would have raised the rolls £43,000,000 a year.

The miners' delegates, seeing the large amount of profit in exported coal, thought they would like to hear it jingling in their pockets. The Government, however, decided that the price of export coal must be reduced £2 per ton.

Running Time in Bituminous Mines October, 1917, to Date

CONDENSED figures on time worked and lost at the mines, which the bituminous operators have been furnishing weekly to the Geological Survey, are given in the following table, prepared by F. G. Tryon:

SUMMARY OF REPORTS ON OPERATING CONDITIONS AT SOFT COAL MINES IN THE UNITED STATES, OCTOBER, 1917 TO APRIL, 1920

Figures represent per cent of full time operated and shut down for various causes.

Period	Per Cent Operated	Per Cent of Full Time Lost on Account of: Total Lost All Causes	Transportation Disability	Labor Shortage and Strikes	Mine Disability	No Market	Other Causes and No Cause Given
1917—3rd Quarter....	72.6	27.4	17.1	5.3	3.6	....	1.4
1918—1st Quarter...	66.9	33.1	24.2	2.4	4.1	0.8	1.6
2nd Quarter..	75.1	24.9	12.2	6.2	3.2	1.2	2.1
3rd Quarter..	83.0	17.0	7.2	4.6	3.8	0.2	1.2
4th Quarter..	77.4	22.6	4.2	9.3	3.0	5.0	1.1
1919—1st Quarter...	57.0	43.0	1.6	1.9	2.3	36.2	1.0
2nd Quarter..	54.7	45.3	2.2	3.1	2.6	36.9	0.5
3rd Quarter..	65.1	34.9	16.4	4.4	3.2	9.7	1.2
4th Quarter..	56.1	43.9	7.3	33.3	2.2	0.2	0.9
1920—To April 10..	60.2	39.8	33.1	2.8	2.6	0.4	0.9
Calendar year 1918..	75.6	24.4	12.0	5.6	3.5	1.8	1.5
Calendar year 1919..	58.2	41.8	6.9	10.6	2.6	20.8	0.9

Price-Pancoast Breaker Relies On Gravity To Do Much of the Work

Only Two Conveyors Are Installed in This Breaker—One of These Handles the Condemned Coal and the Other the Rock—Degradation Is Thus Kept at a Minimum

BY DEVER C. ASHMEAD
Tarrytown, N. Y.

IN THE effort to achieve economy in operation as well as better preparation, anthracite coal companies have shown a marked tendency to rebuild or remodel their breakers during the last few years. Old-time dry breakers have been extremely wasteful because of the unfavorable working conditions with which the men have had to contend, the unnecessary breakage of the coal, the large force of men and boys required for the operation of the breakers and the incomplete preparation obtained.

Among the coal producers who in the last few years have remodeled their breakers is the Price-Pancoast Coal Co., at Scranton, Pa. This firm's old breaker was of the dry type, and it yielded results that were unsatisfactory, in that a large amount of dust was formed during the treatment of the coal. Besides this the coal was not properly prepared.

No change was made in the building but the machinery and methods were entirely altered. The headframe and the breaker are practically one, as is shown in the accompanying photograph of the breaker. The headframe is of steel construction, while the breaker proper is of wood.

At present the arrangements for handling coal at the top of the headframe and breaker are extremely old-fashioned and dangerous. No accidents have occurred, however. The coal company has ordered and will this spring install self-dumping cages which will dispense with the services of twelve men who are now required to handle the coal cars at this point, and this will further reduce the likelihood of accident.

It is necessary at present to haul the cars a distance of about 50 ft. from the landing stage to the dump. The cars are moved out by means of a small hoisting engine and are brought back to the cage after dumping by a car haul.

After being dumped from the cars the coal passes

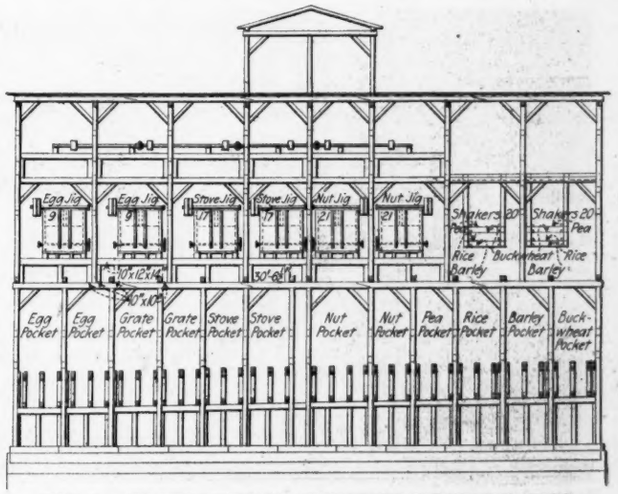


FIG. 1. CROSS-SECTION SHOWING SHAKERS, JIGS AND POCKETS
Great simplification of arrangement marks the remodeled breaker

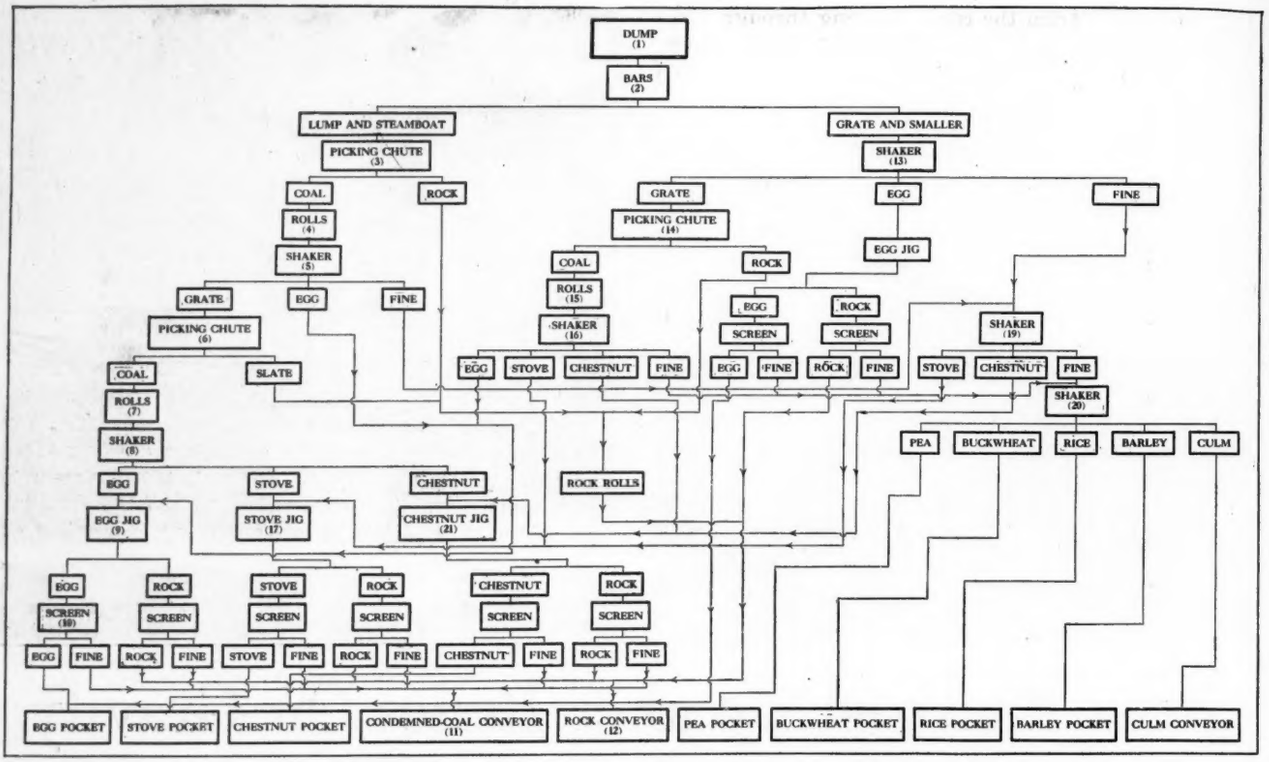
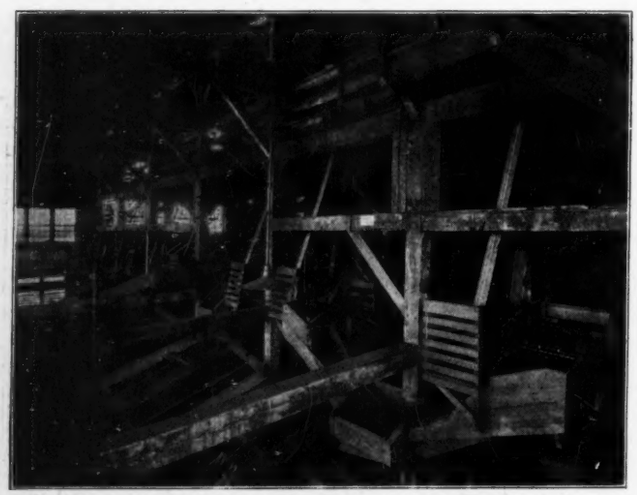


FIG. 2. FLOW SHEET OF THE PRICE-PANCOAST BREAKER

over a bar screen (see Fig. 2) which separates it into two sizes—steamboat and larger, and grate and smaller. The steamboat coal and larger passes through a picking chute (3), where the rock is separated. The coal then goes through a set of rolls (4) and from them to a shaking screen (5), which separates the coal into grate, egg and fine coal. The grate size from shaker 5 is next picked on a picking chute (6), after which it goes to another set of rolls (7) and from there it passes to another shaking screen (8) having three decks preparing egg, stove, chestnut and fine. The egg coal then passes to the egg jigs (9), where the coal is separated from the rock. Leaving the jig, the egg coal then passes over a small stationary screen (10), which removes the undersize.

The material passing the screen then goes directly to the egg pocket, while the fine coal is sent to the condemned-coal conveyor (11). In a similar manner the rock from the egg jig (9) passes over a screen and is hand picked in order to catch stray pieces of coal that pass through the jig with the rock. The coal there obtained is thrown in with the egg coal and goes directly to the pocket. The rock from the jigs passes to the rock conveyor (12) and the fine particles which have passed through the screen are taken to the condemned-coal conveyor. The egg coal made on shaker 5 goes directly by means of chutes to the egg jig (9), where it is prepared in a manner similar to that above described.

Coal passing through the main bars (2), grate and smaller, goes over a shaking screen (13) having two decks on which grate, egg and fine coal are sized. The grate coal passes over a picking chute (14), where the



FIGS. 3 AND 4. VIEWS ON THE JIG AND SHAKER FLOORS

Photographs often give distorted views. While both of these pictures partake of this defect, it is particularly noticeable in Fig. 4, where shaker suspensions and columns appear badly out of plumb.

rock is separated from the coal. Passing through a set of rolls (15), the coal then goes over a three-decked shaking screen (16), making egg, stove, chestnut and fine. Added to the coal of this size from shakers 5 and 8, the egg is treated in jigs, as previously described.

Uniting with the stove coal from shaker 8, the stove from shaker 16 passes to the jigs (17) and receives exactly the same kind of treatment given the egg size. The clean coal goes to the stove pocket while the undersized coal passes to the condemned-coal conveyor and the rock to the rock conveyor.

The chestnut coal (from shakers 8 and 16) is handled in the same manner, there being practically no difference in the method between the egg-, stove- and chestnut-coal treatment except that in this case no effort is made to hand pick the slate from the chestnut jigs and to recover any coal that might pass through.

From shaker 13 the egg coal goes directly to a jig (18) which is located near the top of the breaker, and the coal receives at this point exactly the same preparation as was received by the egg coal from shaker 8. The coal from this jig is sent directly to the egg pocket without further treatment.

From shakers 5 and 13 the fine coal is conducted in chutes to the fine-coal shaker (19), which has two decks on which stove, chestnut and fine coals are prepared. The stove and chestnut coal unite with the same respec-

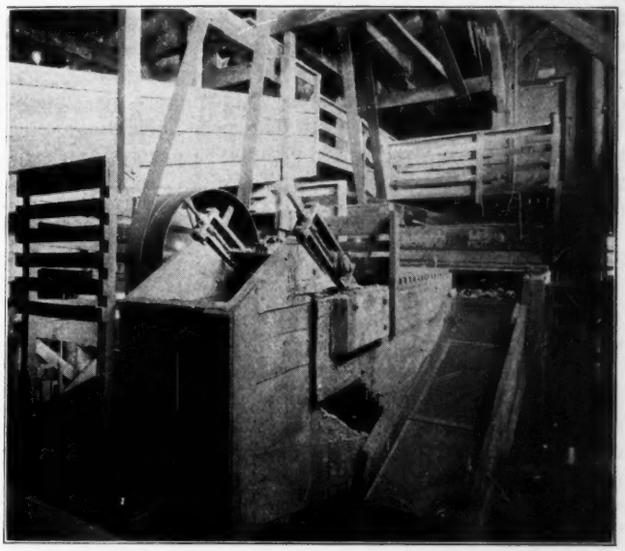
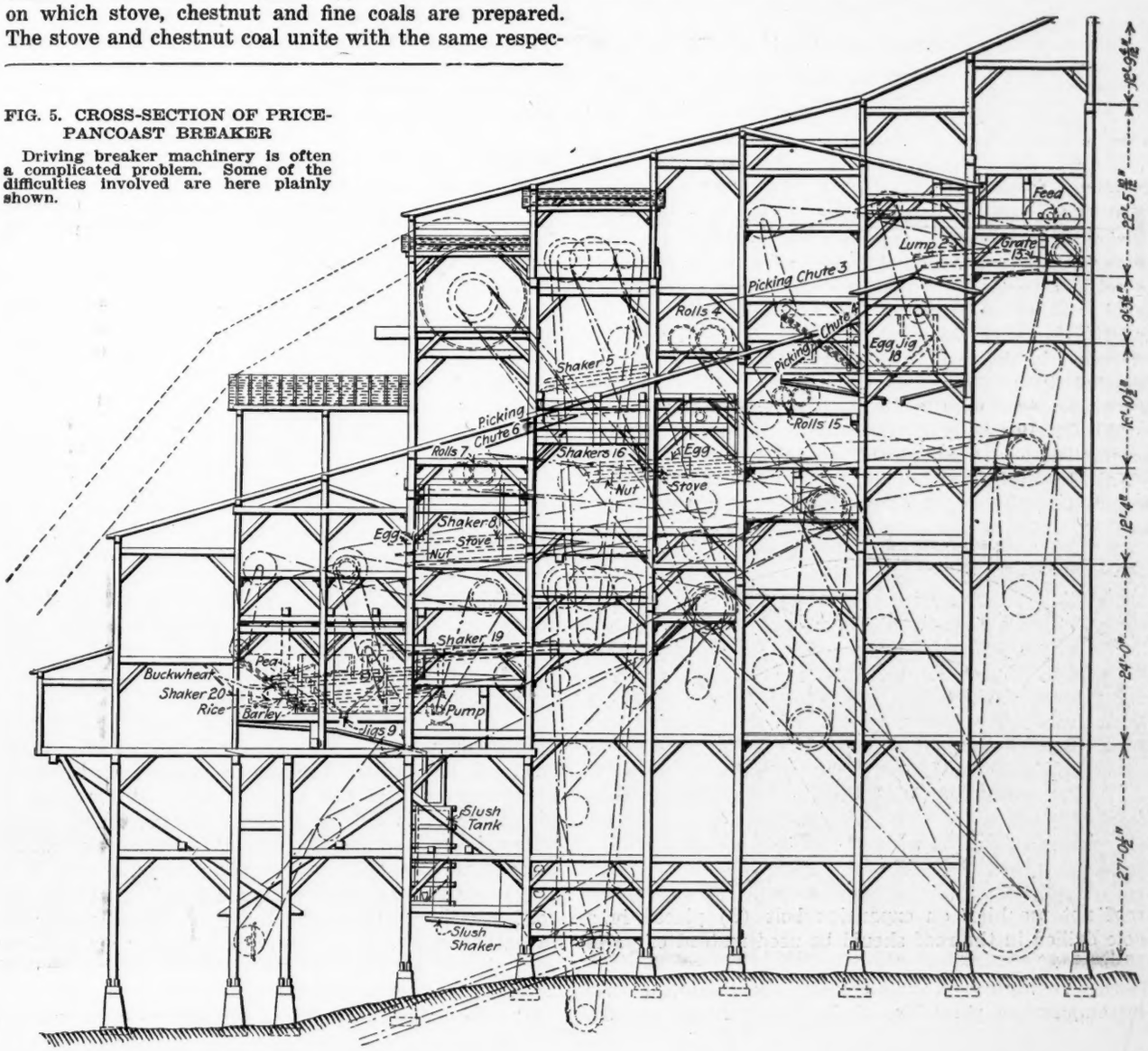


FIG. 4. EGG JIG NEAR THE TOP OF THE BREAKER

The egg coal, made on the second set of shakers near the top of the building, is jigged immediately and sent direct to its proper pocket over the loading track.

FIG. 5. CROSS-SECTION OF PRICE-PANCOAST BREAKER

Driving breaker machinery is often a complicated problem. Some of the difficulties involved are here plainly shown.



tive sizes from shakers 8 and 16 and are treated with them as has already been described. The fine coal from shaker 18 is passed to a four-decked shaker (20) on which is also treated the fine material from shakers 8 and 16. Five sizes are made on this shaker—pea, buckwheat, rice, barley and culp. The pea, buckwheat, rice and barley pass directly into their respective pockets, while the culm is returned to the mine for filling purposes.

Rock rolls crush to small size the rock from picking chutes 3, 6 and 17 and it is then delivered to the rock conveyor together with the rock from the jigs (9, 17, 18 and 21). This conveyor delivers the coal at a point where it can be sent into the mine for filling.

The condemned-coal conveyor carries the condemned coal, together with the undersized coal from the jigs and lip screens, back to shaker 8 for treatment. Some of the culm is settled in a slush tank in the bottom of the breaker and then passed over a shaking screen on which No. 2 barley is prepared. This coal is used in the boiler house when mixed with rice and barley sizes.

The Price-Pancoast Co. insists that as far as possible its coal be handled by gravity during preparation. With this idea in view it has so designed this breaker that there are no elevators within it other than the condemned-coal and rock conveyors.

Comparatively little extra height was required to so lay out the method of preparation that it could be operated by gravity, and the cost of this extra construction probably was offset by avoiding the expenditure that the installation of elevators and conveyors would have entailed. As the breaker does not have to be made any higher by reason of this differentiation of the plans from those which are usually adopted in breaker construction there is no extra cost from this source while, by reason of the absence of elevators, a marked saving is made in the power required to operate the breaker and the cost and annoyance from breakdown is reduced. A further economy arises from a reduction in the degree to which the coal is broken in the operation of the breaker. The fewer times coal has to be handled the less will be the degradation.

Correct Method for Trolley Wiring Mines—II

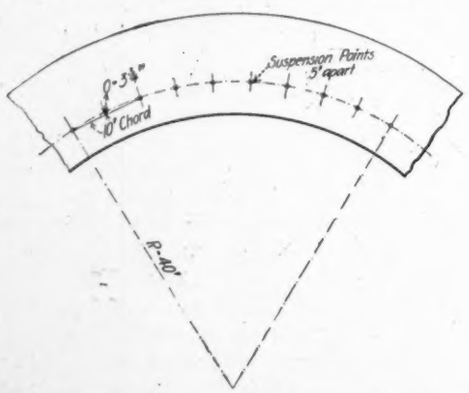
Standard Methods of Hanging Curves and Placing Frogs, Section Insulators, Anchors, Protection Boards and Wire Splices—System of Salvaging Old Equipment Described

By M. W. Beddow
Lundale, W. Va.

IT IS the purpose of the article to supply a description of standard and economical methods for the hanging of underground trolley wire, to be followed by mine wiremen. On the final page of this article is reprinted the table giving the various parts used in construction with the numbers by which they are demonstrated in the test. The previous exposition in the issue of April 22 described (1) the dead ends and (2) the suspensions used in trolley-wire work.

(3) The hanging of trolley wire on curves may be accomplished in a variety of ways, viz:

(a) In high coal, single track (see Fig. 5), the fixture is made up of parts Nos. 6, 7, 12, 19, 20, 21 and 33. Where the coal is soft and shelly and the



roof not too high an expansion bolt (8) placed in a hole drilled in the roof should be used instead of parts 12 and 20.

(b) In high coal, double track, the support fixture is composed of parts Nos. 6, 7, 12, 19, 20, 21 and 33, the same as in fixture (a), while in addition the type N hanger, double curve (No. 22), is necessary.

(c) In low coal where curve hangers or pull-overs cannot be used the proper hanger support must be installed and spaced according to the radius of the curve as shown in Table II and illustrated in preceding column.

Remarks—It is always better to use curve hangers or pull-overs when the height of the coal will permit. Curve hangers or pull-overs give the wire that much-desired flexibility which eliminates hard spots, kinks at the points of suspension and which permits the trolley wheel to traverse the wire with the greatest ease and smoothness, thus decreasing the wear on the wire, on the trolley wheels and on their bushings. In cases (a) and (b), where the wooden plug is used, it is sometimes split at the end and a wedge inserted so that when it is driven into the hole in the roof the wedge bears against the bottom of the hole and is forced into the split in the plug, expanding it (the plug) against the sides of the hole. The hole in the roof for the reception of the plug is drilled with a breast auger or, if the material is hard, with a Niron ratchet. The galvanized wire strand (33) is spliced into curve hangers (19 and 22) in cases (a) and (b).

TABLE II.

Radius of Curve	Chord in Feet	Middle Ordinate in Inches	Distance Between Suspension Points
40	10	3¾	5 ft.
50	10	3	5½ ft.
60	10	2½	6 ft.
75	10	2	6½ ft.
85	10	1¾	7 ft.
100	10	1½	7½ ft.
200	10	¾	10 ft.

(4) Frogs are installed at all switches and turnouts.

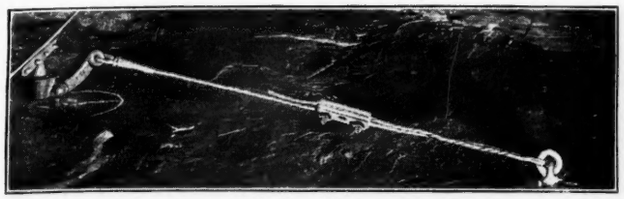


FIG. 5. THE CURVE HANGER OR PULL-OVER
It is always advisable to use this fixture where the height of the coal will permit.

(a) The frog fixture complete is made up of materials Nos. 1, 2, 3, 6, 7, 8, 24, 25, 33 and 34.

Remarks—The branch line wire is dead ended over the frog as shown in Fig. 6. There should be little tension in this dead end; not enough to pull the frog out of place. The purpose of this dead end is largely to hold the end of the branch line wire out of the way and to protect the frog in the event that a heavy stress comes on the branch-line wire between the frog and the section switch.

The frog is steadied and held in alignment by means of No. 6 galvanized wire passed through the pull-off rings in the frog. The wire is doubled from the pull-off rings to the strain insulator. The clevis end of the strain insulator is attached to an eyenut, screwed onto an expansion bolt in the roof on each side of the frog and then twisted to get the necessary tension to hold the frog in its proper position. The hanger suspensions supporting the wire on either side should not be too close to the frog as it is not desirable that the frog be held too rigidly.

The type and degree of frog here specified have given good service and even if only located and installed in approximately the correct location it relieves the motormen of the trouble caused by the trolley pole jumping off or getting on the wrong wire at frogs.

(b) Frogs should be placed from the point of the track frog or the point of the track switch the distance indicated in the table below:

30 lb. Rail	44 in. Gage No. 3 Frog	5 ft. Switch Points
Degree	Distance from Point	Distance from Point
Trolley Frog	of Switch	of Track Frog
8	2 ft. 3 in.	17 ft. 8¼ in.
15	6 ft. 6 in.	13 ft. 5½ in.
40 or 56 lb. Rail	44 in. Gage No. 3½ Frog	7 ft. 6 in. Switch Points
8	4 ft. 6 in.	20 ft. 1½ in.
15	9 ft. 10 in.	14 ft. 9¼ in.

Remarks—The angle of the trolley frog should always be less than the angle of the track frog. In Fig. 7, "A" is the point of intersection of the branch trolley wire with that on the main line. Trolley frogs must never be located between point A and point of the track frog, but must invariably be placed between point A and the point of switch. Before setting a trolley frog place hangers "BB" opposite the track frog at a horizontal distance of 53 in. (gage plus 9 in.) from it. On these hangers is placed the section switch. The hangers "BB" also should be at the regulation distance, 9 in., from the gage of the branch track.

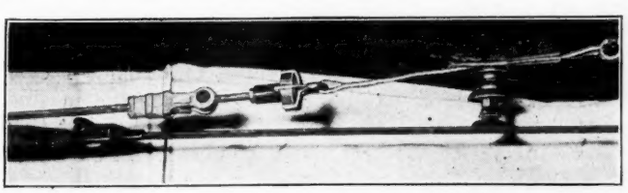


FIG. 6. DEAD END ON A BRANCH-LINE WIRE
Little tension, not enough to pull the trolley frog out of line, should be applied to this dead end.

(5) Section switches or insulators are highly desirable pieces of apparatus. (a) The switch fixture consists of parts Nos. 5, 6, 7, 8, 9, 24, 26 and 27.

Remarks—Wherever a trolley frog is used and a branch circuit is taken off the main line it is necessary to install two section switches (26), one on the main line and the other on the branch. If there is a short circuit or ground on the branch, the section switch on this line can be pulled and work can continue on the main line. If there is trouble on the main-line wire inside of the branch, the main-line switch is pulled and work need not stop on the branch line.

If trouble develops in the mine and a ground or short is reported by the sub-station attendant, by trying one switch and then the other it can soon be ascertained whether the trouble is on the main line or on the branch circuit.

The switches are placed close together so that unnecessary time will not be consumed in walking a hundred feet or more up the branch entry and then back and up the main entry two or three hundred feet. When the switches are placed at too great a distance from the branching point trouble may occur between

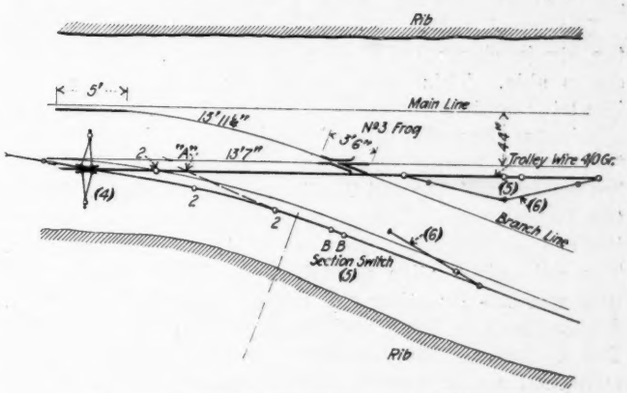


FIG. 7. TROLLEY WIRING AT A TURN-OUT
This shows the correct relative positions of frog, section switches, anchors, etc.

them and the frog and it would then be necessary to go to the next pair of switches, 500 to 1,700 ft. away, cutting off a whole section of the mine simply because a switch was not placed correctly.

The switch on the main line should be placed 12 ft. inside the point of the track frog. The switch on the branch line is placed opposite the track frog on the hangers "BB," as previously mentioned.

The switches should be so placed that the handles point toward the outside. If they are set with the handles pointing toward the inside and a motor comes from the inside going outbye and the trolley wheel jumps off as it comes to the switch (which should not happen but which does nevertheless), the chances are that the pole will pull out the switch. The locomotive, however, will roll on toward the outside, and when the wheel is replaced it will be on wire outside of the switch and will give current to the motor. It usually happens upon such occasions that the motor continues on its way without the motorman noticing that the switch has been pulled. In the meantime the motors and machines on the trolley line inside the switch are without power and by the time the trouble is discovered much time may have elapsed.

Of course, when the switch is placed with the handle pointing toward the outside the switch can be knocked out in the manner above described only when the

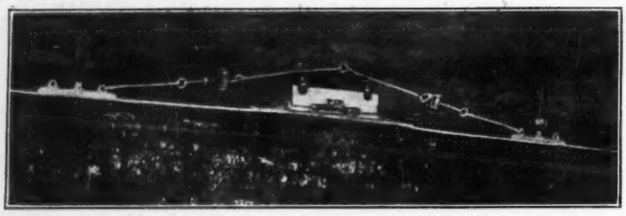


FIG. 8. A SECTION INSULATOR ANCHORED IN PLACE
Anchors should be placed on each side of the switch if the pull in the trolley is great.

motor is going inbye, and if it is so thrown it will be discovered immediately because the motor will be found to be on the dead side of the switch. The section switch must be protected by anchors; otherwise an extraordinary stress coming on the wire on either side of the switch would pull it in two. This was a common occurrence before the protection of switches with anchors was introduced. An anchor is placed on each side of the main line switch, while on the branch line switch an anchor is placed on the inside of the switch only. The wire on the outside of the switch extends but a short distance to the trolley frog.

The Brooklyn strain insulator is placed 12 in. from the strain clamp (27), with the insulated bolt on the clamp side. This puts the bell or large part of the insulator against the roof—if the roof is low—and thus eliminates the possibility of the device getting grounded thereon. A galvanized strand is spliced into the Brooklyn strain insulator and the Detroit strain clamp. When the Detroit strain clamp is screwed onto the hanger the eyebolt must be taken out of the strain insulator. The galvanized wire strand on the dead side of the insulator has its other end passed through the eyenut, doubled back on itself and fastened with a 3-bolt clamp. The eyebolt of the Brooklyn strain insulator is then tightened up to secure the necessary tension in the wire.

Section switches must always be placed on hangers. Where the top is low it may be necessary to cut a channel in the roof to accommodate these hangers so that the runway of the switch will be in alignment with the trolley wire. Many switches with a downward curve in the wire on either side may be seen. This is because the trouble was not taken to cut a channel in the roof for the hangers. A job of this kind should not be tolerated and should be ordered taken down and installed properly.

Where the roof is high, suspensions (2-f) should be used. All section switches are numbered. A brass check with the number of the switch stamped on it is tacked on each switch. This number, shown in its correct location on the trolley-wire map, is used when orders are given to isolate trouble. The sub-station attendants and section foremen are given detailed instructions what to do in the event of a short circuit or ground on the trolley lines. Such troubles are speedily found and isolated, the maximum time required for this purpose never exceeding ten minutes.

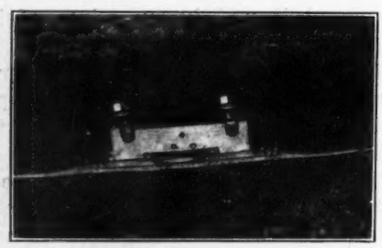


FIG. 9. UNANCHORED SECTION SWITCH
Two supports are always necessary to support a section switch.

In some mines, instead of using section switches, section insulators and circuit breakers (automatic or manual) are employed. The section insulators are mounted in the same manner as section switches but a feeder is taken off each side of the insulator and run to the circuit breaker, which is mounted on pipe supports in a convenient refuge hole or breakthrough. However, in the present status of the art of mine wiring I do not think it pays to use circuit breakers in the mines except at points where an attendant is employed and a telephone is installed.

(6) Anchors are built up of parts 5, 6, 7, 8, 24 and 27.

Remarks—Anchors should be installed every 500 ft. on main-line wire. Without the protection of anchors, in the event of a slate fall or other unusual strain coming upon the wire it might be pulled down for a thousand feet or more on each side of the trouble.

FIG. 10. TROLLEY PROTECTION BOARDS
Protection of this kind should be adequate to prevent contact with the wire anywhere at the turnout.

When anchors are installed every 500 ft., the wire is divided into sections and any trouble arising is confined to the region in which it occurs. Anchors are installed in the same way as that described under section switches (5).

The manufacturers furnish only screws with the Detroit trolley clamps (27). These screws frequently work loose and render the anchor valueless. Such screws extend through the clamp far enough to permit nuts being employed to jam them. Extra nuts for this purpose should always be used on these devices.

(7) Protection boards are made up of parts Nos. 28, 29 and 30.

Remarks—I have experimented with every kind of a protection board that I could think of or that I ever heard of but have finally come to the conclusion that those here described are the best and the cheapest that can be installed. Wooden plugs are placed and expanded in the same manner as described under curves (3).

Where the roof is low a swinging protection board may be better than a rigid one. Such a board can be made by having the blacksmith make hangers from

FIG. 11

Nixon Ratchet

This device is extremely useful for putting plug holes into the roof for trolley hangers and the like.

½-in. round iron and putting eyenuts upon expansion bolts placed in the roof and nailing the boards to these hangers. As a general rule protection boards do not extend far enough along the wire at crossings. They frequently extend only from the point of switch to the point of the track frog, but this is not far enough.

In Fig. 10 the protection boards are too short. They should come forward at least 6 ft. No part of the crossing should go unprotected. It should not be possible for a man to bump his head into the wire in turning from one entry into another. In many instances protection boards are placed too far from the wire. They should be located 4 in. from the wire on either side.

(8) Splices or connectors are composed of parts Nos. 32 and 35.

Remarks—The splicer shown in Fig. 12 without a doubt is the one that is quickest, cheapest and easiest

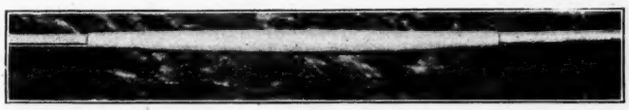


FIG. 12. AN EFFECTIVE TROLLEY WIRE SPLICER

to apply. The trolley wire is held in place by means of tapered steel dogs that are barbed on one side so as to grip the wire and tapered on the other to correspond with the tapered inner wall of the splicer. It is not necessary to solder this connection as the tension of the wire is sufficient to keep the dogs in place.

In using this splicer, the ends of the wire are inserted in each end of the splicer. This is easily done, for the wire goes in straight and no short-radius curves are necessary. The dogs are slipped through the slot in the center of the splicer and placed properly, tension is put on the wire and the connection is made. This procedure is much easier and quicker than that necessary when using an extruded metal or brass trolley wire connector. With such a device the wire must be pushed through a curved path, brought out on top and a short-radius curve bent in it. About this time the wire breaks and a few more inches of it must be pushed through and the process repeated. In my experience no K-I splicer has ever failed under strain. The wire will break first.

Tools necessary for hanging wire are:

(100)	2 1¼ in. bits *	(117)	1 chalk line
(101)	2 1½ in. bits *	(118)	2 comealongs with flat gripe for 4/0 grooved wire *
(102)	1 8-in. file	(119)	10 ft. of ¼-in. chain *
(103)	1 plumb bob	(120)	1 1-qt. blow torch
(104)	1 25-ft. metallic tape	(121)	1 hand saw, 8-point, cross cut
(105)	1 piece of chalk *	(122)	1 brace
(106)	1 hanger wrench *	(123)	1 ½-in. bit with square taper shank
(107)	1 clamp wrench *	(124)	1 pulling tool *
(108)	2 10-in. Stillson wrenches	(125)	1 hatchet
(109)	1 1½-lb. hammer	(126)	1 breast auger *
(110)	1 10-in. Westcott wrench	(127)	1 heavy screw driver
(111)	1 pair 8-in. pliers	(128)	1 12-in. monkey wrench
(112)	1 punch	(129)	1 hack saw frame for 12-in. blades
(113)	1 cold chisel	(130)	12 12-in. hack saw blades *
(114)	1 pair of wire stretchers (lever and chain*)		
(115)	1 1-ton chain block *		
(116)	1 wire tightener (O.B. No. 8126*)		

The tools marked with an asterisk (*) are furnished by the company; the others each wireman is required to own himself.

Fig. 11 shows clearly how a pipe has been fitted up for use with the Nixon ratchet in order to drill vertical holes. This drill possesses a combination of qualities—lightness, convenience, speed in operation, ability to drill all kinds of top—that I have not seen equalled. The hanger and clamp wrenches furnished by the companies that sell the hangers and clamps are short lived. They are too narrow and too light and the jaws are soon sprung. It is much better to have the blacksmith make substantial wrenches for these purposes.

The wire stretchers (114) shown in Fig. 13 are made in the shop from a piece of flat iron rod, some ⅝-in. chain and two comealongs. Three holes are punched in the flat iron rod, about 4 in. apart, near one end. The center of the main chain—it is about 10 ft. long—is fastened in the center hole. This acts as the fulcrum of the lever.

In each of the other two holes is fastened a short chain about 16 in. long, with a hook at the end which

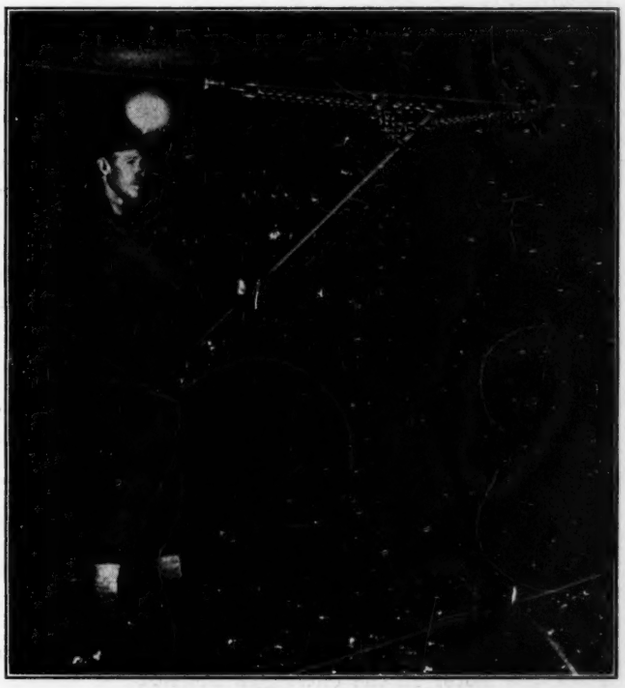


FIG. 13. HOME-MADE WIRE STRETCHER

This device may be fastened to either two wires or to one wire and a post or other anchor and the wire quickly tightened

FIG. 14. PULLING TOOL IN USE

This curved bar is extremely useful in removing the lag screws from the wooden support plugs.

is so fashioned as to fit over a link of the long chain. The lever, in tightening wire, is worked back and forth. As it is drawn one way, it loosens the hook on one of the short chains and this is fastened two or three links ahead of its former position on the long chain. The lever is then moved in the opposite direction, and the other chain is loosened and moved up two or three links on the long chain. In this way, the necessary tension on the wire is speedily secured.

The pulling tool (124) shown in Fig. 14 is used in withdrawing the lag-screw support from the wooden plug when the entry is finished and the wire is being taken down.

(10) Trolley wire must be extended periodically. When an entry has advanced to such a distance that the motorman finds that he has barely enough cable on his reel to reach the inside face, he reports this fact to his foreman and orders are given for additional wire to be hung. The wire car—equipped with a reel of wire, tools, necessary material, etc.—is attached to a trip going to this entry. When it arrives the motor pulls the proper length of wire off the reel and it is cut by the wireman and laid down in the clear on the crosscut side of the entry. In pulling the wire off the reel a comealong is used. In no case is the wire allowed to be kinked or looped, as the avoidance of such sharp bends facilitates handling and stretching. A kinked or looped end has to be cut off and is usually wasted.

In the meantime the wiremen put up the suspensions to a point as close to the face of the entry as the top will permit—if draw slate is encountered the suspensions are not put up until it has been taken down or the place otherwise made safe. These suspensions are lined up 31 in. from the center of the track (the track gage is 44 in.). A chalk line is stretched on the center line of the entry and the hangers are placed in a parallel line 9 in. from this center line.

On straight track and where the top is regular the hangers are spaced 30 ft. apart; where the top is irregular, the hangers are so spaced as to secure the best possible vertical alignment of the wire, so that the wire clears the roof and so that the trolley wheel will not touch the roof at any time.

Trolley extensions are usually made in the evening after the motor in the entry has finished for the day. The nearest section switch controlling the "juice" on this particular entry is pulled, making the end of the wire dead. The dead-end fixture is taken off, advanced and put on the end of the piece of wire about to be installed. The turnbuckle on the dead end is opened up as far as possible. The other end of the wire is connected to the wire already in place, with a splicer.

At the inside end of the new wire a prop or tie is placed on end and wedged between the roof and floor to serve as a pulling post or anchor for the chain blocks or wire stretchers. To this post is fastened with $\frac{5}{8}$-in. chain either the chain block (tool No. 115) or the wire stretchers—lever and chain—(tool No. 114). The chain block or wire stretcher, as the case may be, is fastened to the galvanized strand of the dead-end fixture close to the turnbuckle by means of a comealong, and the slack in the wire is taken up.

Before the wire is made tight five or six of the clamps holding the wire outside of where the dead-end installation has just been removed are loosened because when the dead end is taken away the drawing up of the wire ordinarily pulls the nearest hangers out of plumb. The wire is now stretched tight, an eyenut is screwed onto the expansion bolt near the end of the galvanized strand on the dead end, a thimble is placed in the eyenut and the end of the strand is run through the eyenut and around the thimble, turned back on itself and fastened with a 3-bolt clamp.

The chain block or wire stretcher is now loosened and the comealong taken off. The turnbuckle in the dead end is next employed to bring the wire to the proper degree of tautness. The wiremen now go to the outside hangers, where the clamps have not been fastened to the wire, proceed to put the wire into these clamps and draw them securely to the wire. As they perform this bolting-up process they knock the clamps gently toward the outside with a hammer, just enough to barely get the suspension out of plumb. This tends to regulate the spans between hangers. When the clamps are all tightened up there is usually a little slack at the dead end which is taken up with the turnbuckle.

While two men are bolting up the clamps the third man of the wire crew is painting the hangers, clamps and the other sherardized materials with a bright red paint having an asphaltic base. A lead paint should never be used for this purpose. This painting protects these materials from the corrosive action of the mine air and water and increases their life several fold. Finally, the tools, materials left over and any scrap copper that has been made are loaded on the wire car.

MATERIALS USED IN HANGING TROLLEY WIRES IN MINES*

1. 410 Grooved trolley wire
2. Wedge grip. O.B. No. 12,634, opening in clevis $\frac{11}{16}$ in., diameter of clevis bolt $\frac{5}{8}$ in. Will take 410 grooved or $\frac{1}{2}$ in. round strand
3. Giant strain insulator, $2\frac{1}{2}$ in. diameter with large eye and clevis
5. $\frac{1}{2}$ in. galvanized steel wire strand
6. 3-bolt guy-wire clamp, O.B. No. 3,206, length 4 in. with square hole and square head on bolt
7. Hubbard eye-nut, drop forged, to screw on $\frac{5}{8}$ in. bolt; inside diameter of the eye is 1 in.
8. Expansion bolt. O.B. No. 10,073, 6 in. long
9. Universal mine hanger, O.B. No. 11,309, form 1, 2 in. high
19. Type N hanger, O.B. No. 11,650, single curve, complete with separable arm
20. Wooden plug, diameter $1\frac{1}{2}$ in., length 12 in.; to be split out of ash or other soft wood
21. Detroit trolley clamp, O.B. No. 10,972; 4-screw clamp
22. Type N hanger, double curve, O.B. No. 11,651, complete with separable arm
24. Single Brooklyn strain insulator, O.B. No. 9,995; $\frac{5}{8}$ in. eyebolt
25. Type D trolley frog, malleable iron with renewable bronze tips, 8 degree, 410 grooved; right hand O.B. No. 11,892; left hand O.B. No. 11,897
26. Type M mine section-insulator switch, O.B. No. 11,600
27. Detroit double strain clamp, O.B. No. 10,370
28. Wooden plug, $1\frac{1}{2}$ in. x 18 in., split at end with a wedge fitting in the split; to be made out of ash or other soft wood
29. Boards, 1 in. x 4 in. x 14 ft.
30. 8d nails
32. K-I splice, 15 in. long, O.B. No. 8,573
33. $\frac{1}{4}$ in. galvanized steel-wire strand
35. Dogs for K-I splice, O.B. No. 5,700

* Abridged from table appearing April 22.

Reading Co. Completes New Mining Town of Lorraine, Pa.

Concrete Sidewalks in Front and Around House, Concrete Gutters and Curbs, Streets Electrically Lighted, Running Water in all Houses, Heat Supplied by Pipeless Furnaces and Ample Closet Room Are Notable Features of Attractive Dwellings Containing Seven Rooms

AT ITS Eagle Hill Colliery, near Pottsville, Pa., the Philadelphia & Reading Coal & Iron Co. has commenced and partly completed the new town of Lorraine. This town now consists of 24 double dwellings and a school house. It will be enlarged from time to time as housing demands may determine. At present there are only three streets in the place but there is sufficient ground to make the town about four times its present size. Each house has large grounds surrounding it, giving plenty of room for gardens and lawn. The grounds are inclosed by a picket fence.

Concrete walks extend from the sidewalk completely around each house. The street is graded and has concrete curbs and gutters. A stretch of lawn about five feet wide lies between the curb and the concrete sidewalk, with another strip between the sidewalk and the fence line. The streets are electrically lighted. Running water is supplied in all houses, and each is furnished with an outbuilding that can be used either as a garage or storehouse, or for any similar purpose. Six fire plugs are placed at regular intervals along the curb line and the town is furnished with a fire house containing a hose cart. The houses are of an attractive design and are uniform in plan. They are painted different colors, however, in order to avoid monotony of appearance as far as possible. All the houses have seven rooms besides the cellar.

The cellar does not extend the full length under the house but is 12 ft. 9 in. x 27 ft. 4 in. and 6 ft. 6 in. in the clear, which gives reasonably ample headroom. A coal bin is placed in the front part of the cellar at a window and within easy access from the street. The flue for the front of the house extends down into the cellar so that a pipeless furnace can be used for heating. The company has installed a number of this type of furnaces. There is an entrance to the cellar from the outside as well as one from the kitchen, as may be seen by a glance at Fig. 1. The cellar floors are all finished in concrete.

On the first floor, Fig. 1, there are three rooms, the living room, the dining room and the kitchen. They are all 12 x 13 ft. in dimensions. The stairway opens into both the dining room and the kitchen. There is also a front porch 5 x 8 ft. and a side porch 5 x 12½ ft. Plenty of light and sunshine is assured by numerous windows.

The second floor has three bedrooms and a hall. Two of these bedrooms are the same size as the rooms on the first floor but the third is a little smaller, being only 9 ft. 9 in. x 11 ft. One extremely utilitarian feature of these houses is the large number of good sized closets. The attic, or third floor, Fig. 1, extends over only the front portion of the building and has one big finished room 10 x 24½ ft. and one large closet.

Fig. 2 is a good illustration of the outside of the house, which is quite attractive. The roofing is vulcanite slab shingles. These dwellings are placed rather near the street line. The indispensable school house is now in course of construction in the town but is not yet quite finished.

The housing problem, now quite acute the world over, is present in the anthracite region as well as elsewhere and much study is being devoted to its solution. The day and age when a coal miner and his family could be lodged in the "shack" are past and gone, probably never to return. The houses composing a modern mining community must today compare favorably with those of industrial towns and cities or the miners' sojourn

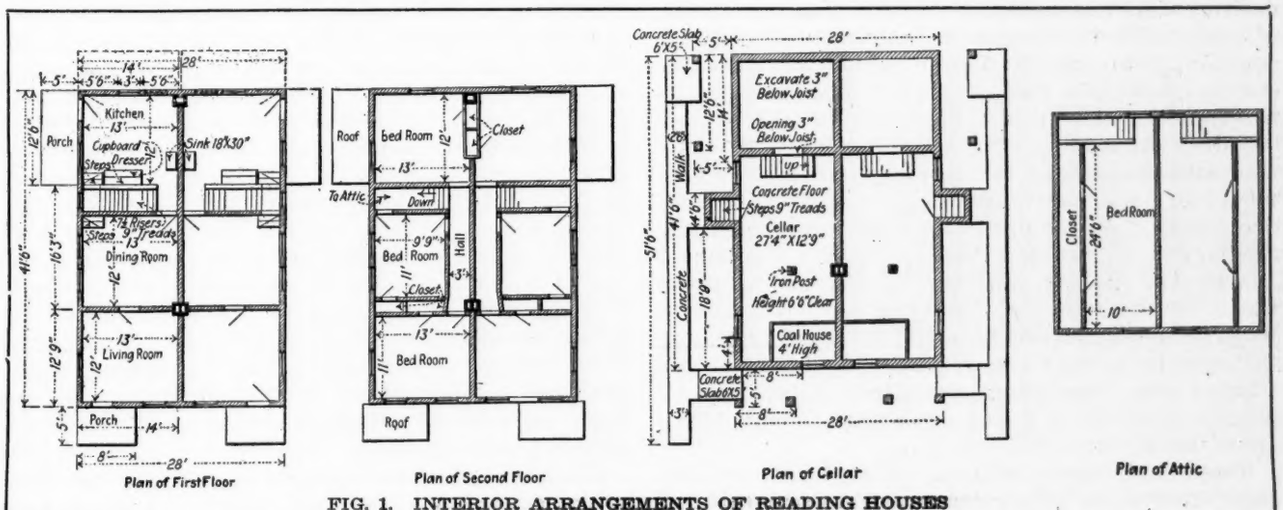


FIG. 1. INTERIOR ARRANGEMENTS OF READING HOUSES

These houses are of the double type, having seven rooms on each side. Every dwelling has a finished cellar and a finished room in the attic.

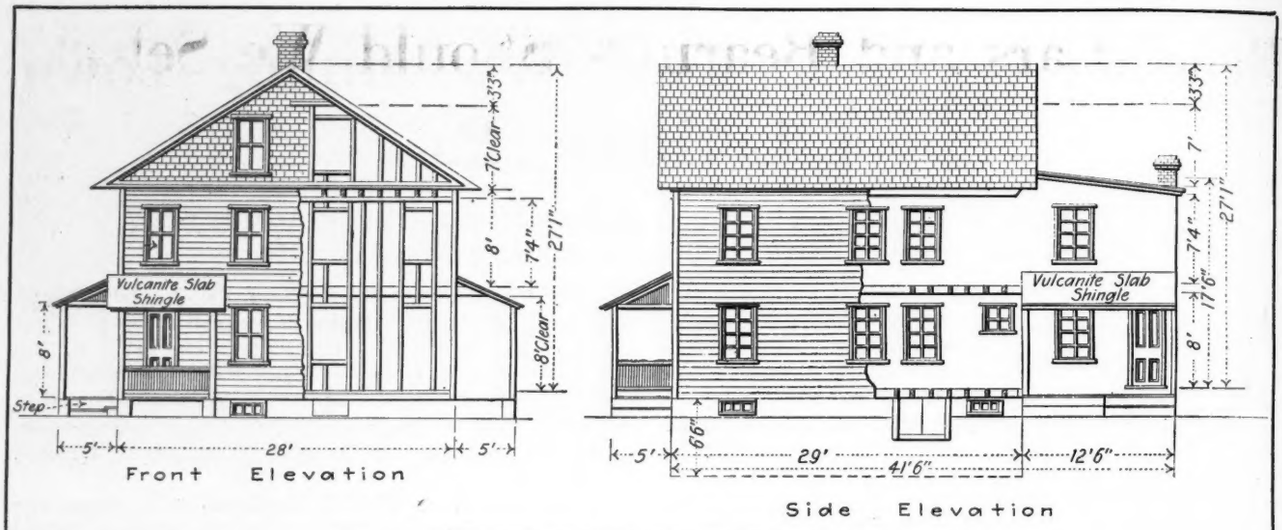


FIG. 2. EXTERIOR OF THE NEW HOUSES AT LORRAINE

Although the exterior of these houses is plain, still, because of their location and varied color scheme, they are quite attractive.

therein will be short and the employing company will be continually looking for men to take the places of those seeking modern homes. The planning and construction of a complete town present many problems, but more and more the tendency is toward creating buildings with many modern conveniences.

Coal Is, in a Sense, a Hardened Petroleum

Virtually Devoid of Petroleum Wells, Germany Obtained Practically All Oil Products from Distillation of Coal—Low-Temperature Distillation, Giving Products Such as Are Obtained in Petroleum Distillation, Seems to Be Growing in Favor

CONDITIONS encountered during the recent war rendered it desirable for Germany to utilize to the fullest the coal resources of the nation. Such utilization is perhaps even more necessary now. During the height of hostilities Germany carried on some important scientific work at the Institute for Coal Research in Muelheim. Professors Franz Fischer and W. Glund there made certain discoveries the value of which to Germany and its industries cannot yet be accurately estimated.

The seriousness of conditions at the time compelled the scientists to direct their attention primarily to devising ways and means by which all the constituents of coal could be utilized as directly and efficiently as possible. Both scientists have proved by their investigations and studies that all products of petroleum can be extracted also from coal.

To perfect a distillation of coal under conditions approximating those obtaining in nature, especially in regard to low temperature and atmospheric pressure, had already been attempted by Boernstein in Berlin. Similar experiments were made by Pietet, a Frenchman, and by Wheeler, an English scientist. Fischer and Glund, however, went into the study of coal tar at low temperatures, extracting phenol by the same process as that used in the petroleum industry. By means of distillation with superheated steam they secured oils of pleasant odor and a golden color which proved themselves useful lubricants.

These experiments brought out another important fact. Distillation at low temperature shows that the same products may be extracted from coal that the petroleum industry gains from crude oil: namely, fuel oil, machine oil, lubricants, paraffin and benzine. It was found, therefore, that coal, in a certain sense, is a hardened petroleum. Simultaneously the fact was established that tar resulting from low-temperature distillation has an entirely different chemical composition from that ordinarily secured. Low temperatures yield combinations like petroleum and benzine, higher temperatures combinations like benzol.

There can be no doubt that these discoveries are of value to Germany's economic life, petroleum being almost entirely lacking in that country. The researches of the scientists will now lead to the development of a second industry for the production of tar which will not be won, as heretofore, through coke furnaces but by a process of distillation at low temperature. Germany and her industries now hope to become independent either entirely, or at least in large measure, of imports of petroleum and its byproducts.

In the same manner as with the usual distillation of tar there remains in the case of the low-temperature process a coke. This, however, is not of the same consistency as that produced heretofore. Experiments to give this coke the required consistency are now under way and have already resulted in a product which is called "semi-coke" and which can be used for fuel purposes. This coke is also termed "smokeless coal," although it still contains a small percentage of an easily inflammable substance, which burns, however, without producing smoke.

Science is now confronted with the task of giving this smokeless coal such consistency that it can be utilized, perhaps in the form of briquettes, as fuel for industry and for domestic consumption.

What Cars and Bearings Should We Select?

Anti-Friction Bearings Are Rapidly Gaining in Favor Because They Are a Good Investment—Cars Should Be Made as Low as Conditions Will Permit on Account of the "Man Item"

By H. G. Nash
Huntington, W. Va.

FOR the past year or so I have been reading the comments appearing in *Coal Age* and elsewhere on mine cars and roller-bearing wheels of the "pin" and "flexible" types. It is assuredly mystifying to observe the seeming diversity of opinion on a subject that to me appears easily solved, especially so far as regards the roller-bearing car or truck. Because there has been and still is much doubt in the minds of some operators on the above subject, I want to state a few facts that I have picked up from personal observation which have been highly valuable to me and which should go far toward settling in the minds of some doubters two important questions, viz., Are roller-bearing mine cars a good investment? Which does it pay to use, a low mine car or a high one?

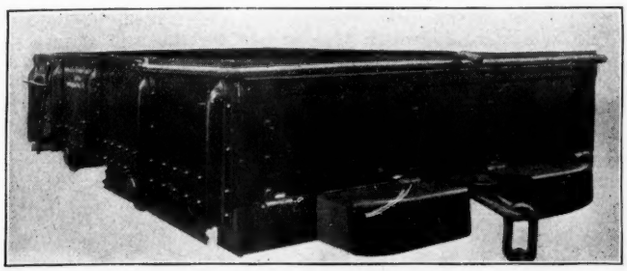


FIG. 1. QUARTERING END VIEW OF LARGE-CAPACITY LOW CAR
This car is 30 in. high over all and has a struck capacity of 90 cu.ft.

I will first take up the subject of roller-bearing mine cars and trucks. For the past ten years the roller-bearing mine car has been a profitable investment. As evidence of this fact it is an easy matter to turn to almost any coal field and see mine cars equipped with roller-bearing trucks that have been giving excellent service throughout that entire period at a saving in power, lubricant and labor for its application, wheel repair and general upkeep cost.

Roller Bearings Insure Low Lubrication Cost

Some friends of mine have been using roller bearings for a number of years and I will quote one as saying that he produced an output close to a million tons during the specified period. He has a long haul, heavy loads and hard service, but in spite of this fact his expenditure for lubrication and labor for its application has been .00122c. per ton of coal passed over the tipple. In my own experience the least lubricant cost I have seen applying to an improved self-oiling wheel has been .00989c. per ton. The man who gave me this figure stated that the black oil bought was charged both to machinery and cars and he felt that this figure should probably be a little higher as he believed that more oil was used on his mine cars than was charged to them.

Another friend of mine roughly estimated that it was costing him $5.68 per year per car for lubricant and labor for applying it to his self-oiling wheels and that he was getting his roller-bearing equipment lubricated for approximately $1.30 per car per year. As the two companies furnishing these figures are large ones and carefully investigate all types of equipment before they make any statements it seems to me that this saving alone is worthy of serious consideration, since it comes from practical experience.

W. H. Noone, in the issue of *Coal Age* dated Jan. 15, 1920, p. 148, "assumes that a large majority of coal mines still have their mine cars equipped with plain bearings." He may be in a measure justified in this assumption, for plain bearings were first put in service simply because there was nothing else to use and the older mines are so equipped through necessity. I believe, however, that he will revise his statement if he will look around at the newer properties—those that have been developed in the past eight years—for he will find an astounding number that use roller-bearing cars. He will also find numbers of companies who equipped their mine cars with plain bearings and are now gradually changing to those of the roller type.

Bearings May Be Saved from Broken Wheels

Another statement made by Mr. Noone I want to take issue with is the following: "However, aside from the excessive cost of renewals, the cost of repairing such bearings is excessive." I have in mind a friend who operates approximately 5,000 roller-bearing cars of the flexible type. He tells me that he has yet to purchase a repair bearing and that he has lost practically no bearings from wreck or other cause. He also states that he often has broken wheels, but that he puts the bearing back into another wheel and keeps it going.

In my own experience I was connected with a large company which has both the self-oiling and the roller-bearing wheels, and during a period of five years I failed to see a roller-bearing wheel on the scrap pile because of bearing trouble, although I did see a few with broken flanges, treads and spokes. These cars

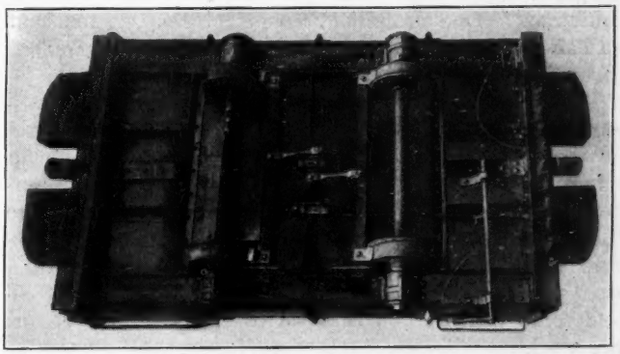


FIG. 2. BOTTOM VIEW OF THE CAR SHOWN IN FIG. 1
This view shows plainly the arrangement of wheels, journals, brake rigging, etc.

received scarcely any attention and the majority (at least 90 per cent) are running satisfactorily today.

In looking over the field I find such experiences as this to be the rule, therefore I cannot agree that the roller-bearing wheel or this type of bearing means "excessive cost of renewals, etc." I have in mind several mines located in West Virginia having long inclines that have found self-oiling wheels absolutely useless. Their planes were long and the cars came down at a high rate of speed. The centrifugal action thus set up caused the oil to be thrown to the circumference of the hub and away from the bearing surface. The wheels therefore rapidly wore out in the bore. The same firms have many roller-bearing wheels that have been going for from four to five years and have not given the least trouble.

It seems to be Mr. Noone's belief that a large part of the rolling stock of a mine will get wrecked in the course of its life and that the wrecking will tear up the mine-car bearings. This I believe is contrary to the experience of most of the operators using roller-bearing mine cars, for the smashing up of a wheel does not mean, necessarily, a broken bearing. In the majority of cases the modern roller-bearing wheel has the bearing so securely housed that it is well-nigh impossible to injure it, and if the wheel be broken the bearing may be taken out and put into another wheel casting. Consequently a higher efficiency will be secured from a roller-bearing wheel in general service, and when an occasional wreck occurs the only loss will be a broken wheel casting. Nowadays, with heavy rail and well-kept track, serious wrecks are far more infrequent than in former years when it was considered good policy to use nothing heavier than 20-lb. mine rail.

Roller Bearings Are Favorites

In spite of the fact that in past years there have been some mighty inefficient types of roller-bearing mine cars put on the market and that even now some roller-bearing trucks are much better than others, nevertheless, in those fields where roller bearings have been tried the demand for them is heavy. I have questioned several mine-car manufacturers with whom I do business as to the percentage of roller-bearing trucks they sell as compared with their total output, and I find that the reputable manufacturers who ship into West Virginia make from 50 to 95 per cent roller-bearing equipment. One prominent manufacturer tells me that he has averaged 90 per cent of this type of equipment throughout a period of several years.

In my section of the state a majority of the companies—a large majority—that produce a million tons or more per annum each are users of roller-bearing mine cars and are gradually getting rid of their plain-bearing wheels and trucks. I noticed some months ago that a certain concern was experimenting on a roller-bearing crankshaft for automobiles and I understand that a large railroad in the East is trying out both ball and roller bearings on railroad cars. Both these firms are working with the hope of perfecting the particular type of bearing suitable to each individual application.

There has always been an effort made to get away from bearing friction and daily we see new applications of anti-friction bearings being used in mine machinery of every sort. A representative of a large company building mining machines tells me that his firm will soon have an undercutter on the market equipped throughout with roller bearings. The plain bearing is still in use because there are certain applications for which there has not as yet been developed any type of anti-friction bearing that can supplant the plain bearing.

It is, however, merely a matter of time until practically all types and kinds of machinery will be equipped with some form of anti-friction bearing and the one that is nearest to being fool-proof and most durable, though it may cost most in the beginning, is going to become the accepted type for the purpose in question.

Now we will consider the mine car itself. I was much amused at a miner some months ago. He was loading coal over the side of a car 41 in. high which would hold with a little "cribbing" approximately 3 tons. He said he was going over to another operation, as he could load "two of that man's cars to one of these, and a lot easier." On investigation I found that "that man's cars" were only 26 in. high and that because of their width and length the miner would put approximately 4 tons of coal into each.

Big, Low Cars Are Most Advantageous

It seems to me that this is the answer when the question of the height of a car is under consideration. Make it as low as possible but keep the container so large that with a little coal piled up on top the same load will be had as with the high car level full. Of course there are mines that are unable to "crib" or pile coal higher than the side boards because of conditions peculiar to themselves, but the lower the car the easier it is to load.

I notice in this field that there is a decided tendency to keep the car below 32 in. in over-all height, and several of my friends who have high cars are seriously considering a change to a lower type on account of the "man item" involved in loading the high cars. The two accompanying illustrations show a car recently built by one of the largest companies in West Virginia. It is unusually low, yet at the same time it has a large capacity. It is all steel, 30 in. in over-all height and has a water-level capacity of about 90 cu.ft. and can be "cribbed" to hold about 4 tons without losing coal in transit. This car, by the way, is equipped with the flexible type of roller bearing, and it is my understanding that all of the many hundreds of cars owned by this company have roller bearings of some variety.

The efficiency of mine cars is a problem that is receiving constantly increasing consideration from the operator. This is as it should be, since the mine car is about the most important piece of equipment on the job. The finest kind of a tipple, power house and general plant may be provided, but if a poorly-designed car is in use, coal will not go over the tipple as cheaply as it should.

An Efficient Car Is Necessary

It is "up to" the operator to secure a car that will do the work for which it is intended. The fact that an additional brace here or an inch more (board measure) there, and a good truck equipped with modern roller bearings, all add to the first cost of the car should not be the cause of the operator forgetting that he should get what he pays for, namely, a good car, economical to operate and keep going, and one that will bring back to him in actual dollars and cents its additional first cost by giving "value received."

Federal Trade Commission Publishes Coal Production Costs for January, 1920

Commission Believes That Garfield's Wage Increase of 14 Per Cent Raises Production Costs 23c., or 11 Per Cent—Shortened Time Also Had Some Effect on Increased Costs, Especially at the Mines with a Slow Run

BEGINNING with the month of January, 1920, the Federal Trade Commission resumed the collection of monthly cost reports from the bituminous coal operators. The information obtained is similar to that secured for the Fuel Administration during the war period—August, 1917-December, 1918. in the various coal-cost reports of the commission, of which reports No. 1 (Pennsylvania-bituminous), No. 2 (Pennsylvania-anthracite) and No. 3 (Illinois-bituminous) has already been issued, and reports No. 4 (Alabama-, Tennessee-, and Kentucky-bituminous), No. 5 (Ohio-, Indiana-, and Michigan-bituminous),

TABLE I. JANUARY, 1920, SALES REALIZATIONS AND "CLAIMED" COSTS OF 1,589 OPERATORS AND 1918 ANNUAL SALES REALIZATIONS AND "REVISED" COSTS OF 2,483 OPERATORS, BY GENERAL COMPETITIVE REGIONS

	January, 1920							Year, 1919						
			Claimed Costs per Ton						"Revised" Costs per Ton					
General Competitive Regions	No. of Operators	Sales Realization per Ton	Labor	Supplies	General Expense	Total F.O.B. Mine	Margin per Ton	No. of Operators	Sales Realization, per Ton	Labor	Supplies	General Expense	Total F.O.B. Mine	Margin per Ton
Central Competitive "Interstate" Field[1]	461	$2.45	$1.63	$0.23	$0.28	$2.14	$0.31	765	$2.45	$1.39	$0.25	$0.26	$1.90	$0.55
Eastern Adjacent Districts[2]	545	2.82	1.72	.25	.41	2.38	.44	966	2.81	1.45	.28	.32	2.05	.76
Western Adjacent Districts[3]	68	2.63	1.64	.21	.29	2.15	.48	138	2.75	1.75	.26	.26	2.27	.48
Southern Appalachian Field[4]	252	3.01	1.85	.27	.41	2.53	.48	288	2.81	1.61	.29	.36	2.26	.55
Southwestern "Interstate" Field[5]	148	3.52	2.47	.22	.40	3.09	.43	172	3.13	2.15	.25	.34	2.74	.39
Rocky Mountain Field[6]	115	3.11	1.85	.30	.36	2.51	.60	154	2.73	1.63	.26	.30	2.19	.54
United States	1,589	$2.74	$1.74	$0.24	$0.34	$2.32	$0.42	2,483	$2.65	$1.49	$0.26	$0.29	$2.04	$0.61

[1] Includes all of Illinois, Indiana, Ohio and southwest district of Pennsylvania.
[2] Includes all of Maryland, West Virginia, Virginia and the central district of Pennsylvania.
[3] Includes all of Michigan, Iowa and No. 1 district of Kentucky.
[4] Includes all of Alabama, Tennessee and districts Nos. 2, 3 and 4 of Kentucky.
[5] Includes all of Missouri, Kansas, Arkansas, Oklahoma and Texas.
[6] Includes all of Colorado, New Mexico, North Dakota, Montana, Wyoming, Utah and Washington.

During 1919 the commission did not collect such information.

The January, 1920, statistics herewith presented are preliminary figures only, covering returns from 1,589 operators. They show "claimed costs" only, i.e., figures compiled directly from the returns actually appearing on the operators' reports. The commissioner has not subjected these figures to any critical analysis or revision. This has been left undone to hasten matters so as to present to the public immediately the best available information. The "revised costs" for January, 1920, will appear in a subsequent report. Experience with the 1918 figures indicates that the revision will in most cases reduce "claimed costs" only a few cents per ton.

For the purpose of general comparison, statistics for 1918 are shown. These figures appear in detail No. 6 (Maryland-, West Virginia-, and Virginia-bituminous) are in press, and No. 7 (Trans-Mississippi States-bituminous) in preparation.

The information obtained by the commission shows minor subdivisions of costs, but the summaries published in this bulletin are (1) the cost of labor, (2) the cost of supplies, and (3) the general expense or overhead involved in mining coal, bringing it to the surface, preparing it for market, and placing it in railroad cars for shipment. The total of these three costs is (4) the f.o.b. mine cost shown by the commission. All costs and sales realizations shown in this bulletin are based on tons of 2,000 lb.

The costs shown are not intended to include selling expense; interest on the investment, including borrowed capital; allowances for income and excess profits taxes, and profit on investment. The difference be-

TABLE II. COMPARISON OF COSTS AND SALES REALIZATIONS FOR YEAR 1918 WITH THOSE OF JANUARY, 1920, FOR 1,272 IDENTICAL OPERATORS, BY GENERAL COMPETITIVE REGIONS

	Year, 1918 Per Ton of 2,000 Lbs. Revised						January, 1920 Per Ton of 2,000 Lbs. Claimed							
General Competitive Regions	No. of Operators	Average Monthly Production, Tons	Sales Realization	F.O.B. Mine Cost	Margin	Excess of 1918 Claimed Cost Over 1918 Revised Cost, Cents per Ton	Production, Tons	Sales Realization	F.O.B. Mine Cost	Margin	Increase of Jan., 1920, Claimed Cost Over 1918 Claimed Cost, Cents per Ton	%	Jan., 1920, Production Compared with Average Monthly Production in 1918 Increase %	Decrease %
Central Competitive "Interstate" Field	390	9,323,810	$2.45	$1.89	$0.56	.07	8,956,880	$2.46	$2.13	$0.33	17	9	...	4
Eastern Adjacent Districts	434	5,156,261	2.77	2.00	.77	.10	4,693,396	2.83	2.37	.46	27	13	...	9
Western Adjacent Districts	58	823,290	2.52	1.92	.60	.07	950,791	2.62	2.13	.49	14	7	15	..
Southern Appalachian Field	179	2,155,909	2.80	2.19	.61	.08	2,194,415	3.06	2.63	.43	36	16	2	..
Southwestern "Interstate" Field	117	1,163,650	3.11	2.70	.41	.07	1,197,895	3.52	3.09	.43	32	12	3	..
Rocky Mountain Field	94	2,393,959	2.36	2.19	.17	.07	2,637,850	3.11	2.52	.59	26	12	10	..
United States	1,272	21,016,879	$2.60	$2.03	$0.57	.08	20,631,227	$2.78	$2.34	$0.44	23	11	...	2

TABLE III. COSTS AND SALES REALIZATIONS OF 1,589 OPERATORS FOR JANUARY, 1920, AND OF 2,483 OPERATORS FOR YEAR 1918

State and District	January, 1920 — Per Ton of 2,000 Lbs. — Claimed Costs — No. of Operators	Sales Realization	Labor	Supplies	General Expenses	Total, F.O.B.	Margin per Ton	Year 1918 — Per Ton of 2,000 Lbs. — Revised Costs — No. of Operators	Sales Realization	Labor	Supplies	General Expenses	Total, F.O.B.	Margin per Ton
Alabama:														
District No. 1	18	$2.78	$1.75	$0.33	$0.35	$2.43	$0.35	20	$2.42	$1.53	$0.33	$0.31	$2.17	$0.25
District No. 2	21	4.08	2.63	.35	.48	3.46	.62	21	3.23	2.00	.37	.38	2.75	.48
District No. 3	27	3.19	2.03	.30	.34	2.67	.52	40	2.63	1.77	.29	.32	2.38	.25
District No. 4	3	3.72	.30	.30	.52	3.12	.60	4	4.13	2.28	.77	.54	3.59	.54
State total	69	$3.28	$2.03	$0.33	$0.37	$2.73	$0.55	85	$2.74	$1.73	$0.33	$0.33	$2.39	$0.35
Arkansas:														
Sebastian District	10	$3.64	$2.67	$0.28	$0.37	$3.32	$0.32	16	$3.27	$2.14	$0.25	$0.29	$2.68	$0.59
Excelsior-Logan District	4	4.96	3.69	.30	.45	4.44	.52	5	4.60	3.47	0.43	0.55	4.45	.15
Anthracite District	5	5.67	3.70	.11	.35	4.16	1.51	4	4.66	3.23	0.23	0.52	3.98	.68
State total	19	$4.04	$2.89	$0.26	$0.37	$3.52	$0.52	25	$3.42	$2.27	$0.25	$0.31	$2.83	$0.59
Colorado:														
Domestic District	32	$3.43	$1.94	$0.28	$0.42	$2.65	$0.78	41	$2.96	$1.75	$0.27	$0.38	$2.40	$0.56
Trinidad District	11	2.75	1.91	.33	.37	2.61	.14	14	2.49	1.62	0.26	0.27	2.25	.24
Lignite District	10	2.66	1.65	.23	.43	2.29	.37	15	2.46	1.49	0.21	0.40	2.10	.36
State total	53	$3.09	$1.87	$0.28	$0.41	$2.56	$0.53	70	$2.73	$1.66	$0.26	$0.37	$2.29	$0.44
Illinois:														
District No. 1	13	$3.22	$2.32	$0.29	$0.23	$2.84	$0.38	21	$3.11	$2.20	$0.25	$0.26	$2.71	$0.40
District No. 2	24	2.67	1.78	.16	.25	2.19	.48	30	2.69	1.74	.25	.26	2.25	.44
District No. 3	28	2.43	1.61	.18	.19	1.98	.45	51	2.27	1.40	.18	.18	1.76	.51
District No. 4	12	2.25	1.54	.14	.16	1.84	.41	50	2.16	1.39	.18	.17	1.74	.42
District No. 5	2	2.78	2.07	.10	.28	2.45	.33	2	2.79	1.83	.21	.28	2.32	.47
District No. 6	22	2.42	1.72	.17	.20	2.09	.33	54	2.38	1.45	.24	.24	1.93	.45
State total	101	$2.43	$1.66	$0.17	$0.19	$2.02	$0.41	208	$2.35	$1.47	$0.21	$0.20	$1.88	$0.47
Indiana:														
District No. 1	80	$2.37	$1.64	$0.17	$0.26	$2.07	$0.30	92	$2.33	$1.42	$0.21	$0.23	$1.86	$0.47
Brazil Block District	10	2.73	1.98	.19	.51	2.68	.05	10	3.08	1.87	.27	.43	2.57	.51
State total	90	$2.38	$1.65	$0.17	$0.26	$2.08	$0.30	102	$2.35	$1.43	$0.21	$0.24	$1.88	$0.47
Iowa:														
Marion-Monroe-Polk District	6	$3.12	$2.14	$0.15	$0.24	$2.53	$0.59	42	$2.98	$2.17	$0.22	$0.29	$2.68	$0.30
Appanoose-Boone District	9	3.86	2.83	.24	.36	3.44	.42	27	3.32	2.48	.22	.30	3.00	.32
State total	15	$3.36	$2.36	$0.18	$0.28	$2.82	$0.54	69	$3.06	$2.25	$0.22	$0.29	$2.76	$0.30
Kansas:														
Cherokee-Crawford District	29	$3.19	$2.38	$0.18	$0.39	$2.95	$0.24	39	$2.90	$2.00	$0.22	$0.33	$2.55	$0.35
Osage and Leavenworth Districts (combined)	2	4.65	3.35	.04	.44	3.83	.82	3	3.86	2.96	.21	.43	3.62	.24
State total	31	$3.24	$2.41	$0.18	$0.39	$2.98	$0.16	42	$2.93	$2.02	$0.22	$0.34	$2.58	$0.35
Kentucky:														
District No. 1	49	$2.35	$1.45	$0.19	$0.28	$1.92	$0.43	61	$2.32	$1.25	$0.25	$0.24	$1.74	$0.58
District No. 2	49	2.74	1.83	.29	.50	2.62	.12	34	2.61	1.40	.31	.50	2.21	.40
District No. 3	83	2.93	1.52	.19	.41	2.12	.81	104	2.93	1.61	.26	.41	2.28	.65
District No. 4	9	2.78	1.49	.42	.45	2.36	.42	13	2.67	1.29	.25	.31	1.85	.32
State total	190	$2.63	$1.57	$0.23	$0.38	$2.18	$0.45	212	$2.63	$1.36	$0.25	$0.34	$1.95	$0.68
Maryland*	36	$2.87	$1.95	$0.20	$0.45	$2.60	$0.27	62	$2.82	$1.77	$0.26	$0.34	$2.37	$0.45
Michigan	4	$4.31	$2.47	$0.38	$0.50	$3.35	$0.96	8	$4.02	$2.56	$0.54	$0.31	$3.41	$0.61
Missouri:														
District No. 1	22	$3.27	$1.91	$0.27	$0.46	$2.64	$0.63	24	$2.93	$1.80	$0.30	$0.41	$3.51	$0.42
District No. 2	15	3.76	2.78	0.23	0.33	3.34	0.42	20	3.23	2.39	0.25	0.28	2.92	0.31
State total	37	$3.52	$2.35	$0.25	$0.40	$3.00	$0.52	44	$3.08	$2.09	$0.28	$0.35	$2.72	$0.36
Montana	9	$2.88	$1.93	$0.27	$0.23	$2.43	$0.45	17	$2.56	$1.79	$0.25	$0.22	$2.26	$0.30
New Mexico:														
Gallup and Sugarite Districts (combined)	5	$4.00	$2.62	$0.37	$0.65	$3.68	$0.32	5	$3.31	$2.26	$0.32	$0.53	$3.11	$0.20
Carthage and Cerrillos District (combined)	1	4.67	3.20	.54	.65	4.39	.28	4	4.20	2.64	.56	.54	3.74	.46
Raton District	2	3.08	1.66	.24	.35	2.25	.83	2	2.83	1.39	.22	.24	1.85	.98
State total	8	$3.37	$1.92	$0.29	$0.42	$2.63	$0.74	11	$3.04	$1.61	$0.25	$0.31	$2.17	$0.87
North Dakota:														
Northern District	2	$2.93	$2.02	$0.21	$0.50	$2.73	$0.20	3	$2.72	$1.62	$0.20	$0.41	$2.23	$0.49
Southern District	1	2.60	1.73	.15	.41	2.29	.31	3	2.10	1.33	.09	.23	1.65	.45
State total	3	$2.64	$1.77	$0.16	$0.42	$2.35	$0.29	6	$2.22	$1.39	$0.11	$0.26	$1.76	$0.46
Ohio:														
District No. 1	5	$2.89	$2.15	$0.20	$0.47	$2.82	$0.07	9	$2.80	$1.77	$0.30	$0.41	$2.48	$0.32
District No. 2	18	3.17	1.98	.17	.36	2.51	.66	21	3.42	2.06	.23	.48	2.77	.65
District No. 3	28	2.69	1.53	.18	.37	2.08	.61	39	2.57	1.43	.23	.27	1.93	.64
District No. 3a	6	2.91	1.46	.23	.34	2.03	.88	10	2.64	1.58	.29	.44	2.31	.33
District No. 4	17	2.55	1.47	.33	.57	2.37	.18	20	2.74	1.49	.26	.30	2.05	.69
District No. 5	8	2.64	1.94	.27	.33	2.54	.10	10	2.57	1.61	.25	.35	2.21	.36
District No. 6	37	2.79	2.39	.32	.44	3.15	† .36	54	2.89	1.67	.34	.30	2.31	† .85
District No. 7	10	3.33	2.12	.22	.42	2.76	.57	15	3.45	1.96	.26	.41	2.63	.82
District No. 8	19	2.42	1.53	.24	.35	2.12	.30	67	2.49	1.22	.28	.29	1.79	.70
District No. 9	10	2.39	1.67	.21	.25	2.13	.26	11	2.59	1.35	.21	.20	1.76	.83
State total	158	$2.57	$1.72	$0.24	$0.36	$2.32	$0.25	256	$2.61	$1.38	$0.26	$0.29	$1.93	$0.68
Oklahoma:														
Eastern District	33	$4.01	$2.78	$0.25	$0.40	$3.43	$0.58	35	$3.53	$2.49	$0.27	$0.35	$3.11	$0.42
McAlester Vein District	8	5.22	3.27	.48	.59	4.34	.88	8	4.42	3.11	.45	.36	3.92	.50
State total	41	$4.22	$2.86	$0.29	$0.43	$3.58	$0.64	43	$3.68	$2.59	$0.30	$0.36	$2.25	$1.43
Pennsylvania:														
Southwest District	112	$2.49	$1.54	$0.32	$0.36	$2.22	$0.27	199	$2.50	$1.33	$0.29	$0.30	$1.92	$0.58
Central District	252	2.93	1.87	.24	.38	2.49	.44	425	3.05	1.62	.27	.32	2.21	.84
State total	364	$2.72	$1.67	$0.29	$0.36	$2.32	$0.40	624	$2.78	$1.45	$0.28	$0.31	$2.04	$0.74

* Upper Potomac, Cumberland and Piedmont District of Maryland and West Virginia.
† F.o.b. cost exceeded sales realization.

TABLE III.—Continued

State and District	January, 1920 Per Ton of 2,000 Lbs. Claimed Costs: No. of Operators	Sales Realization	Labor	Supplies	General Expenses	Total, F.O.B.	Margin per Ton	Year 1918 Per Ton of 2,000 Lbs. Revised Costs: No. of Operators	Sales Realization	Labor	Supplies	General Expenses	Total, F.O.B.	Margin per Ton
Tennessee:														
District No. 1	32	$2.97	$2.04	$0.21	$0.33	$2.60	$0.37	44	$2.94	$1.83	$0.28	$0.34	$2.45	$0.49
District No. 2	3	2.70	1.74	.13	.37	2.24	.46	3	2.61	1.30	.15	.32	1.77	.84
Blue Gem District	7	3.54	2.55	.34	.38	3.27	.27	5	3.41	2.14	.31	.39	2.84	.57
State total	42	$2.98	$2.04	$0.20	$0.34	$2.60	$0.38	52	$2.92	$1.78	$0.27	$0.34	$2.39	$0.53
Texas:														
Bituminous District	3	$4.79	$3.66	$0.34	$0.66	$4.66	$0.13	4	$4.12	$2.86	$0.41	$0.41	$3.68	$0.44
Lignite District	17	1.65	1.01	.10	.33	1.42	.23	14	1.36	.76	.09	.23	1.08	.23
State total	20	$1.95	$1.26	$0.13	$0.36	$1.73	$0.22	18	$2.02	$1.27	$0.16	$0.27	$1.70	$0.32
Utah	12	3.00	1.59	.30	.38	2.27	.73	11	2.78	1.48	.27	.34	2.09	.69
Virginia:														
District No. 3	2	2.84	1.94	.28	.36	2.58	.26	9	2.81	1.81	.28	.39	2.48	.33
District No. 5	9	2.94	1.84	.42	.48	2.74	.20	22	2.58	1.26	.37	.30	1.93	.65
State total	11	$2.91	$1.85	$0.40	$0.46	$2.71	$0.20	31	$2.60	$1.30	$0.36	$0.30	$1.96	$0.64
Washington:														
Kittitas Bituminous district	4	$3.95	$2.18	$0.31	$0.41	$2.91	$1.04	5	$3.08	$1.90	$0.23	$0.24	$2.37	$0.71
Pierce-King Bituminous District	7	4.17	2.79	.48	.61	3.88	.29	9	4.36	2.75	.43	.53	3.71	.65
Sub-bituminous District	5	4.89	2.54	.52	.61	3.67	1.22	7	3.24	2.10	.39	.34	2.83	.41
State total	16	$4.16	$2.43	$0.41	$0.51	$3.35	$0.81	21	$3.45	$2.19	$0.32	$0.35	$2.86	$0.59
West Virginia:														
Pocahontas District	22	$2.71	$1.35	$0.23	$0.40	$1.98	$0.73	50	$2.45	$1.09	$0.26	$0.28	$1.63	$0.82
Tug River District	5	3.15	1.70	.42	.42	2.58	.57	24	2.72	1.50	.29	.34	2.13	.59
Thacker District	5	2.68	1.58	.40	.36	2.35	.33	20	2.76	1.30	.32	.32	1.94	.82
Kenova District	5	2.87	2.07	.29	.48	2.84	.03	7	2.87	1.72	.18	.43	2.33	.54
Logan District	30	2.54	1.29	.27	.54	2.10	.44	46	2.64	1.13	.26	.33	1.72	.92
New River District	53	3.05	1.85	.27	.51	2.63	.42	102	2.88	1.48	.31	.37	2.16	.72
Kanawha District	48	2.74	1.63	.24	.36	2.23	.51	59	2.60	1.37	.25	.29	1.91	.69
Putnam County District	3	2.93	2.46	.48	.51	3.45	† .52	2	2.76	2.27	.40	.42	3.09	† .33
Mason County District	..	.....	.....	.....	.....	.....	.....	2	2.74	1.74	.30	.31	2.35	.39
District No. 10, Coal and Coke, and Gauley Districts (combined)	32	2.64	1.71	.23	.43	2.36	.28	49	2.59	1.38	.25	.30	1.93	.66
Fairmont District	34	2.62	1.73	.29	.41	2.43	.19	74	2.59	1.35	.27	.34	1.96	.63
Pittsburgh Seam District	9	2.58	1.63	.24	.25	2.12	.46	13	2.55	1.48	.29	.24	2.01	.54
State total	246	$2.73	$1.57	$0.27	$0.42	$2.26	$0.47	448	$2.63	$1.30	$0.27	$0.32	$1.89	$0.74
Wyoming	14	$2.70	$1.65	$0.28	$0.23	$2.16	$0.54	18	$2.41	$1.40	$0.24	$0.22	$1.86	$0.55
Total United States	1,589	$2.74	$1.74	$0.24	$0.34	$2.32	$0.42	2,483	$2.65	$1.49	$0.26	$0.29	$2.04	$0.61

tween the sales realization and the f.o.b. mine cost per ton is the "margin." This "margin" must not be confused with what is called profit. Selling expense, interest, income and excess profits taxes, as well as other items, must be deducted from it before the net profit from the mining operations available for dividends or surplus can be determined.

In the following table are shown for the principal production regions the claimed costs, sales realizations and margins of the 1,589 operators from whom complete reports for January, 1920, have thus far been received. With these costs are also shown the costs (as revised by the commission), sales realizations and margins of the 2.483 operators from whom reports were received for the entire twelve months of 1918. The 1,589 operators had a production of 25,365,384 tons of commercial coal during January, 1920, and the 2,483 operators mined 496,960,342 tons of

TABLE IV. CHANGES MADE IN 1918 CLAIMED COSTS THROUGH REVISION

State and District	Amount the Claimed Cost Exceeds the Revised Cost
Alabama:	
No. 1	$0.05
No. 2	.11
No. 3	.04
No. 4	.20
State	$0.06
Arkansas:	
Sebastian	$0.11
Excelsior-Logan	.00
Anthracite	.16
State	$0.12
Colorado:	
Domestic	$0.07
Trinidad	.05
Lignite	.07
State	$0.07
Illinois:	
No. 1	$0.03
No. 2	.06
No. 3	.02
No. 4	.00
No. 5	.06
No. 6	.06
State	$0.04
Indiana:	
No. 1	$0.05
Brazil Block	.10
State	$0.05
Iowa:	
Marion-Monroe-Polk	$0.06
Appanoose-Boone	.05
State	$0.06
Kansas:	
Cherokee-Crawford	$0.05
Osage and Leavenworth (combined)	.01
State	$0.04
Kentucky:	
No. 1	$0.07
No. 2	.10
No. 3	.12
No. 4	.05
State	$0.09
Maryland:	
Upper Potomac, Cumberland and Piedmont of Maryland and West Virginia	$0.09
State	$0.09
Michigan	$0.17
State	$0.17
Missouri:	
No. 1	$0.13
No. 2	.05
State	$0.08
Montana	$0.05
State	$0.05
New Mexico:	
Gallup and Sugarite (combined)	$0.04
Carthage and Cerrillos (combined)	.13
Raton	.04
State	$0.05
North Dakota:	
Southern	$0.03
Northern	.03
State	$0.02
Ohio:	
No. 1	$0.24
No. 2	.16
No. 3	.11
No. 3a	.08
No. 4	.08
No. 5	.06
No. 6	.08
No. 7	.17
No. 8	.12
No. 9	.03
State	$0.11
Oklahoma:	
McAlester Vein	$0.11
Eastern	.08
State	$0.09
Pennsylvania:	
Southwest	$0.07
Central	.06
State	$0.07
Tennessee:	
No. 1	$0.09
No. 2	.06
Blue Gem	.07
State	$0.09
Texas:	
Bituminous	$0.05*
Lignite	.04
State	$0.04
Utah	$0.08
State	$0.08
Virginia:	
No. 3	$0.16
No. 5	.13
State	$0.13
Washington:	
Kittitas bituminous	$0.15
Pierce-King bituminous	.37
Sub-bituminous	.02
State	$0.18
West Virginia:	
Pocahontas	$0.14
Tug River	.08
Thacker	.20
Kenova	.18
Logan	.20
New River	.15
Kanawha	.11
Putnam County	.08
Mason County	.02*
No. 10, coal and coke, and Gauley (combined)	.10
Fairmont	.04
Pittsburg Seam	.10
State	$0.13
Wyoming	$0.03
State	$0.03
United States	$0.08

* Amount by which Revised cost exceeds the Claimed cost.

TABLE V. COMPARISON OF COSTS AND SALES REALIZATIONS FOR YEAR 1918 WITH THOSE OF JANUARY, 1920, FOR 1,272 IDENTICAL OPERATORS

State and District	Year, 1918 —Per Ton of 2,000 Lbs.— — Revised — No. of Operators	Average Monthly Production, Tons	Sales Realization	F.o.b. Mine Cost	Margin	Excess of "Claimed" Cost Over 1918 Revised Cost, Cents per Ton	January, 1920 —Per Ton of 2,000 Lbs.— — Claimed — Productions, Tons	Sales Realization	F.o.b. Mine Cost	Margin	Increase of Jan., 1920, Claimed Cost Over 1918 Claimed Cost, Cents per Ton	Per Cent	Jan. 1920 Production Compared with Average Monthly Production in 1918 Inc., Per Cent	Dec., Per Cent
Alabama														
No. 0 (Big Seam)	13	376,578	$2.42	$2.08	$0.34	5	373,607	$2.82	$2.46	$0.36	33	16	..	1
No. 2 (Cahaba)	15	137,043	3.40	2.86	.54	11	179,475	4.08	3.46	.62	49	17	31	..
No. 3 (Pratt)	21	377,296	2.64	2.34	.30	4	418,879	3.21	2.67	.54	29	12	11	..
Montevallo	3	50,032	2.72	2.10	.62	20	52,991	3.72	3.12	.60	82	36	6	..
State	52	940,949	$2.72	$2.30	$0.42	6	1,024,962	$3.32	$2.76	$0.56	40	17	9	..
Arkansas														
Sebastian	8	98,615	3.35	2.67	.68	11	76,115	3.60	3.31	.29	53	19	..	23
Excelsior-Logan	3	3,789	4.56	4.55	.01	0	5,020	5.08	4.46	.62	9[1]	2[1]	32	..
Anthracite	2	3,147	5.63	4.68	.95	16	5,635	5.47	3.95	1.52	89[1]	18[1]	79	..
State	13	105,551	$3.46	$2.80	$0.66	12	86,770	$3.82	$3.42	$0.40	50	17	..	18
Colorado														
Domestic	25	347,045	2.92	2.33	.59	7	391,708	3.45	2.65	.80	25	14	13	..
Trinidad	10	242,535	2.49	2.24	.25	5	239,111	2.83	2.60	.23	31	14	..	2
Lignite	8	140,658	2.48	2.14	.34	7	162,786	2.54	2.33	.21	12	5	16	..
State	43	730,238	$2.72	$2.27	$0.45	7	793,605	$3.09	$2.57	$0.52	23	10	9	..
Illinois														
No. 1	10	169,524	3.06	2.69	.37	3	183,852	3.22	2.86	.36	14	5	8	..
No. 2	21	164,120	2.69	2.19	.50	6	219,361	2.66	2.18	.48	7[1]	3[1]	34	..
No. 3	24	1,168,721	2.38	1.80	.58	2	1,162,469	2.43	1.97	.46	15	8	..	1
No. 4	39	858,504	2.15	1.71	.44	0	996,738	2.24	1.79	.45	8	5	16	..
No. 5	2	13,381	2.79	2.32	.47	6	14,307	2.78	2.45	.33	7	3	7	..
No. 6	15	407,376	2.34	1.86	.48	6	420,210	2.44	2.02	.42	10	5	3	..
State	111	2,781,626	$2.36	$1.86	$0.50	4	2,996,937	$2.43	$1.99	$0.44	9	5	8	..
Indiana														
No. 1	59	1,312,987	2.31	1.87	.44	15	1,091,593	2.36	.22	.22	22	11	..	17
Brazil Block	6	32,895	3.12	2.73	.39	10	27,408	3.04	3.04	.00	21	7	..	17
State	65	1,345,882	$2.33	$1.89	$0.44	5	1,119,001	$2.37	$2.16	$0.21	22	11	..	17
Iowa														
Marion-Monroe-Polk	4	52,023	2.95	2.60	.35	6	73,036	3.03	2.55	.48	11[1]	4[1]	40	..
Appanoose-Boone	8	31,477	3.35	3.05	.30	5	37,748	3.88	3.48	.40	38	12	20	..
State	12	83,500	$3.10	$2.77	$0.33	6	110,784	$3.32	$2.87	$0.45	4	1	33	..
Kansas														
Cherokee-Crawford	27	452,260	2.93	2.58	.35	5	459,705	3.21	2.95	.26	32	12	2	..
Osage & Leavenworth	2	13,669	3.81	3.57	.24	1	14,834	4.65	3.83	.82	25	07	9	..
State	29	465,929	$2.95	$2.61	$0.34	4	474,539	$3.26	$2.98	$0.28	33	12	2	..
Kentucky														
No. 1	42	686,029	2.32	1.71	.61	7	766,609	2.35	1.91	.44	13	7	12	..
No. 2	24	362,973	2.70	1.89	.81	10	294,589	2.82	2.41	.41	42	21	..	19
No. 3	63	416,106	2.92	2.20	.72	12	423,665	2.92	2.59	.33	27	12	2	..
No. 4	6	154,308	2.76	1.79	.97	5	129,899	2.77	2.30	.47	46	13	..	16
State	135	1,619,416	$2.60	$1.88	$0.72	9	1,614,762	$2.62	$2.21	$0.41	24	10	..	..
Maryland	32	174,516	2.42	2.35	.07	9	165,511	2.83	2.59	.24	15	6	..	5
Michigan	4	53,762	4.06	3.20	.86	17	73,398	4.31	3.35	.96	2[1]	0	36	..
Missouri														
No. 1	17	137,097	2.90	2.49	.41	13	136,361	3.29	2.65	.64	3	1	..	1
No. 2	14	156,311	3.20	2.87	.33	5	158,642	3.76	3.35	.41	43	15	2	..
State	31	293,408	$3.06	$2.70	$0.36	8	295,003	$3.54	$3.03	$0.51	25	9	1	..
Montana	9	237,218	2.38	2.18	.20	5	299,071	2.88	2.43	.45	20	9	26	..
New Mexico:														
Raton	2	247,424	$2.83	$1.85	$0.98	4	223,338	$3.08	$2.25	$0.83	36	19	..	10
Gallup	3	53,101	3.32	3.18	.14	4	58,715	4.01	3.75	.26	53	17	11	..
Cerrillos	1	4,553	4.41	4.11	.30	13	10,760	4.67	4.39	.28	15	4	136	..
State	6	305,078	$2.99	$2.11	$0.88	5	292,813	$3.36	$2.63	$0.73	47	22	..	4
North Dakota:														
Southern	1	23,870	2.10	1.66	.44	3	23,598	2.60	2.29	.31	60	35	..	1
Northern	2	3,196	2.94	2.12	.82	3	3,565	2.93	2.73	.20	58	27	11	..
State	3	27,066	$2.20	$1.72	$0.48	3	27,163	$2.64	$2.35	$0.29	60	34	0	0
Ohio:														
No. 1	3	10,460	$2.82	$2.54	$0.28	24	10,920	$2.76	$2.67	$0.09	11[1]	4[1]	3	..
No. 2	14	41,508	3.36	2.66	.70	16	47,770	3.16	2.54	.62	28[1]	10[1]	15	..
No. 3	16	78,544	2.66	2.22	.44	11	84,336	2.66	2.26	.40	7[1]	3[1]	7	..
No. 3a	5	9,420	2.63	2.20	.43	8	16,375	2.88	2.05	.83	23[1]	10[1]	74	..
No. 4	11	88,619	2.79	2.02	.77	8	85,360	2.56	2.43	.13	33	16	..	4
No. 5	6	25,819	2.62	2.19	.43	6	24,431	2.66	2.33	.33	8	4	..	5
No. 6	31	216,043	2.86	2.28	.58	8	234,896	2.80	2.39	.41	3	1	9	..
No. 7	6	34,616	3.40	2.55	.85	17	49,519	3.24	2.54	.70	18[1]	7[1]	43	..
No. 8	39	771,609	2.50	1.80	.70	12	678,867	2.43	2.12	.31	20	10	..	12
No. 9	9	425,634	2.58	1.76	.82	3	331,628	2.39	2.14	.25	35	20	..	23
State	140	1,702,272	$2.64	$1.93	$0.71	11	1,564,102	$2.56	$2.22	$0.34	18	9	..	8
Oklahoma:														
Eastern	23	188,461	3.57	3.08	.49	8	220,827	4.03	3.40	.63	24	8	17	..
McAlester Vein	6	37,699	4.47	3.93	.54	11	51,133	45.24	4.34	.90	30	7	36	..
State	29	226,160	$3.72	$3.22	$0.50	9	271,960	$4.26	$3.58	$0.68	27	8	20	..
Pennsylvania:														
Southwest	74	3,494,030	2.50	1.85	.65	7	3,276,840	2.48	2.19	.29	27	14	..	6
Central	209	2,237,932	3.00	2.19	.81	6	1,966,525	2.94	2.51	.43	26	12	..	12
State	283	5,731,962	$2.76	$1.98	$0.78	7	5,243,365	$2.70	$2.32	$0.38	27	13	..	9

[1] Decrease.

TABLE V. COMPARISON OF COSTS AND SALES REALIZATIONS FOR YEAR 1918 WITH THOSE OF JANUARY, 1920, FOR 1,272 IDENTICAL OPERATORS—(Continued)

State and District	No. of Operators	Year, 1918 —Per Ton of 2,000 Lbs.— Revised — Average Monthly Production, Tons	Sales Realization	F.o.b. Mine Cost	Margin	Excess of 1918 "Claimed" Cost Over 1918 Revised Cost, Cents per Ton	January, 1920 —Per Ton of 2,000 Lbs.— Claimed — Productions, Tons	Sales Realization	F.o.b. Mine Cost	Margin	Increase of Jan., 1920, Claimed Cost Over 1918 Claimed Cost Cents per Ton	Per Cent	Jan., 1920, Production Compared with Average Monthly Production in 1918 Inc., Per Cent	Dec., Per Cent
Tennessee:														
No. 1	27	232,234	$2.97	$2.42	$0.55	9	268,364	$2.99	$2.62	$0.37	11	4	16	..
No. 2	2	30,210	2.59	1.90	.69	6	33,197	2.64	2.31	.33	35	18	10	..
Blue Gem	5	19,128	3.41	2.84	.57	7	19,739	3.50	3.24	.26	33	11	3	..
State	34	281,572	$2.96	$2.40	$0.56	9	321,300	$2.98	$2.62	$0.36	13	5	14	..
Texas:														
Bituminous	3	14,236	4.05	3.54	.51	5[1]	8,114	4.79	4.66	.13	117	33	..	43
Lignite	12	58,368	1.36	1.12	.24	4	61,509	1.63	1.36	.27	20	17	5	..
State	15	72,604	$1.89	$1.59	$0.30	4	69,623	$2.00	$1.74	$0.26	11	7	..	4
Utah	9	370,076	$2.78	$2.08	$0.70	8	450,818	$3.38	$2.27	$1.11	11	5	22	..
Virginia:														
No. 3	2	9,776	2.96	2.27	.69	16	13,344	2.84	2.59	.25	16	7	37	..
No. 5	8	62,339	2.77	2.36	.41	13	59,276	2.93	2.78	.15	29	12	..	5
State	10	72,115	$2.81	$2.34	$0.47	13	72,620	$2.91	$2.74	$0.17	27	11	1	..
Washington:														
Kittitas	4	136,333	3.08	2.37	.71	15	155,201	3.96	2.91	1.05	39	16	14	..
Pierce-King	6	90,780	3.80	3.16	.64	37	93,506	4.17	3.89	.28	36	10	3	..
Sub-Bituminous	5	47,034	3.32	3.43	.39	2	50,679	3.91	3.67	.24	22	6	8	..
State	15	274,147	$3.43	$2.81	$0.62	16	299,386	$4.02	$3.34	$0.68	37	12	9	..
West Virginia:														
Pocahontas	20	697,430	2.24	1.51	.73	14	626,984	2.71	1.98	.73	33	20	..	10
Tug River	5	42,547	2.84	2.22	.62	8	43,053	3.15	2.58	.57	28	12	1	..
Thacker	4	34,178	2.68	1.87	.81	20	39,701	2.69	2.30	.39	23	11	16	..
Kenova	5	28,667	2.89	2.33	.66	18	31,636	2.87	2.84	.03	33	13	10	..
Logan	20	398,917	2.65	1.58	1.07	20	319,187	2.53	2.04	.49	26	15	..	20
New River	46	446,805	2.77	2.04	.73	15	398,168	3.04	2.60	.44	41	19	..	11
Kanawha	38	545,387	2.62	1.88	.74	11	567,667	2.73	2.21	.52	22	11	4	..
Putnam County	2	18,204	2.76	3.09	.33[1]	8	17,892	2.82	3.53	.71[1]	36	11	..	2
No. 10, Coal and Coke and Gauley	15	83,421	2.58	1.84	.74	10	90,553	2.55	2.23	.32	29	15	9	..
Fairmont	20	238,336	2.63	2.05	.58	4	203,283	2.67	2.52	.15	43	20	..	15
Pittsburg Seam	8	137,812	2.65	2.04	.61	10	150,616	2.57	2.13	.44	1[1]	0	9	..
State	185	2,671,704	$2.57	$1.81	$0.76	13	2,488,740	$2.73	$2.24	$0.49	30	16	..	7
Wyoming	9	466,803	2.51	1.86	.65	3	474,994	2.66	2.17	.49	28	15	18	..
United States	1,272	21,016,879	$2.60	$2.03	$0.57	8	20,631,227	$2.78	$2.34	$0.44	23	11	..	2

[1] Decrease.

commercial coal during 1918 (an average of 41,413,362 tons monthly).

In table I only 1,589 operators appear for January, 1920, while 2,483 operators are shown for 1918. Also, revised costs shown for 1918 average about 8c. per ton lower than the claimed costs were for that year, and, consequently, the revised margins for 1918 are that much higher. In order to get comparable operators for the two periods there are presented in table II the figures of 1,272 identical operators, and to arrive at comparisons of increased costs the average amounts of revision found for all operators in each region in 1918 have been added to the 1918 revised costs of the operators shown in this table. These 1,272 operators mined 252,202,547 tons during 1918 (averaging 21,016,879 tons monthly) and 20,631,227 tons during January, 1920.

TABLE VI. DISTRIBUTION OF TOTAL F.O.B. MINE COST INCREASES ACCORDING TO CHANGES IN PRODUCTION TONNAGE OF 1,272 OPERATORS, JANUARY, 1920, FROM AVERAGE MONTHLY PRODUCTION, 1918

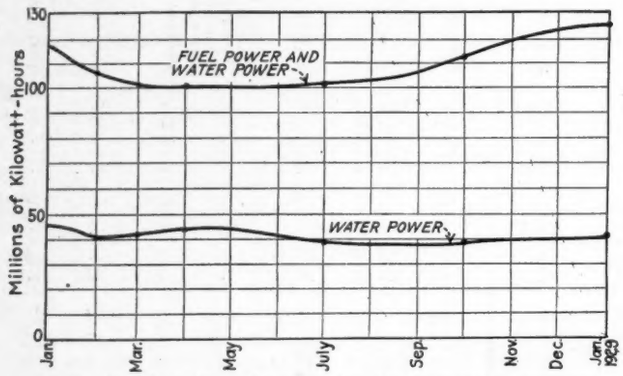
Change of January, 1920, Production from 1918 Average Monthly Production	No. of Operators	Production January, 1920, Tons	Increase of Jan., 1920, Claimed Cost Over 1918 Annual Claimed F.O.B. Mine Cost, Per Ton	Per Cent
Decrease over 25 per cent	3	8,114	$1.17	33
Decrease 16-25 per cent	132	2,270,419	.29	15
Decrease 6-15 per cent	410	7,374,005	.28	14
Decrease 0- 5 per cent	312	4,546,242	.23	10
Increase 0- 5 per cent				
Increase 6-15 per cent	210	2,784,344	.19	9
Increase 16-25 per cent	127	2,651,976	.15	7
Increase over 25 per cent	78	996,127	.12	5
Totals	1,272	20,631,227	$0.23	11

As far as can be judged, therefore, from the returns at present available, the increased cost attributable to the increased wage scale is about 23c. per ton, or 11 per cent (the increased cost shown in table VI for the group where production changed least—5 per cent or less—and where the effect of the wage agreement is consequently best seen). For the total 1,272 operators the average decrease in tonnage was 2 per cent and their average increase in cost 23c. per ton, or 11 per cent. This increase of about 23c. per ton, or 11 per cent, was the result in January, 1920, of the Garfield 14-per cent wage increase, which it should be noted is about one half of the total increase (27 per cent) recently recommended by the United States Bituminous Coal Commission.

The great diversity in mining conditions between the different districts, both in regard to thicknesses of seam mined and the relative use of machinery in mining the coal, caused the wage increase to affect to a different degree the labor costs of the various districts. In the Federal Trade Commission's coal cost reports for 1918 much detailed information on these diverse conditions is available.

Public Utility Consumption of Coal

THE Geological Survey has just issued statistics on the production of electric power at public utility stations that show some interesting relations between water power and steam power. About 63.4 per cent of its total power produced came from the use of fuel—



AVERAGE DAILY PRODUCTION OF ELECTRICITY BY PUBLIC UTILITY PLANTS

coal, gas and oil, equivalent—it is estimated to 38,347,000 tons of coal. Water power represented 36.6 per cent, equivalent in the developed power to 22,140,000 tons of coal.

The interesting feature of these figures is brought out in the accompanying diagram which shows that the seasonal demand for power from public utilities fall upon coal. The water power is almost uniform during the year, being a little higher in the spring, whereas in the winter coal is called upon to meet the winter load.

AVERAGE DAILY PRODUCTION OF ELECTRICITY BY PUBLIC UTILITY PLANTS IN UNITED STATES — WATER POWER AND FUEL POWER, 1909

State	Coal, Short Tons	Petroleum and Derivatives, Barrels	Natural Gas Thousands of Cubic Feet
Alabama	29,211	1,255	0
Arizona	198	42,473	0
Arkansas	8,675	4,888	155,222
California	0	545,829	179,563
Colorado	43,345	110	0
Connecticut	77,311	4,374	10,236a
Delaware	9,139	0	0
District of Columbia	23,237	0	0
Florida	2,425	54,753	0
Georgia	21,179	19,605	0
Idaho	150	10	0
Illinois	411,719	472	0
Indiana	205,453	254	2,025
Iowa	94,185	576	0
Kansas	39,710	91,428	76,283
Kentucky	45,149	188	0
Louisiana	7,589	60,528	68,510
Maine	3,410	49	0
Maryland	39,552	0	1,500
Massachusetts	173,088	1,764	0
Michigan	180,542	139	0
Minnesota	64,060	620	0
Mississippi	14,028	11,841	0
Missouri	90,997	90,657	0
Montana	4,206	22	1,257
Nebraska	37,926	16,503	0
Nevada	367	842	0
New Hampshire	6,768	0	0
New Jersey	156,280	136	280a
New Mexico	4,733	866	0
New York	478,533	763	72,579
North Carolina	20,992	34	0
North Dakota	19,362	150	0
Ohio	401,066	697	161,065b
Oklahoma	8,353	71,940	275,926
Oregon	190	3,657	0
Pennsylvania	532,761	5	49,937
Rhode Island	35,196	7,560	0
South Carolina	11,779	0	0
South Dakota	7,729	1,936	0
Tennessee	22,729	25	0
Texas	58,707	211,222	48,227
Utah	3	0	0
Vermont	1,748	2,146	0
Virginia	43,212	132	0
Washington	10,396	15,612	0
West Virginia	106,230	50	227,900
Wisconsin	64,626	544	0
Wyoming	14,418	4,217	3,300
Total	3,634,662	1,270,872	1,333,810

a Artificial gas. b Includes 61,520 artificial gas.

	Kilowatt-Hours	Per Cent
Total production	40,300,000,000	...
Water power	14,760,000,000	36.6
Fuel power	25,540,000,000	63.4

TOTAL FUEL CONSUMPTION

Coal	35,000,000	short tons
Oil	11,050,000	bbls.
Gas	21,700,000	M. cu.ft.

The production of the electric power reported required the combustion of fuels in the quantities indicated in the preceding table.

PRODUCTION OF ELECTRIC POWER AND CONSUMPTION OF FUEL BY PUBLIC UTILITY POWER PLANTS IN THE UNITED STATES FOR THE MONTH OF JANUARY, 1920*

Thousands of Kilowatt-Hours Produced

State	By Water Power	By Fuels
Alabama	34,864	14,452
Arizona	8,567	11,702
Arkansas	132	7,675
California	164,727	112,346
Colorado	12,784	22,811
Connecticut	9,069	59,256
Delaware	0	6,807
Dist. of Columbia	0	23,317
Florida	965	10,890
Georgia	43,816	10,696
Idaho	48,574	1,348
Illinois	14,831	260,723
Indiana	943	91,788
Iowa	55,574	31,622
Kansas	1,741	35,986
Kentucky	0	23,409
Louisiana	0	18,126
Maine	23,381	1,577
Maryland	284	31,261
Massachusetts	22,009	147,936
Michigan	51,799	138,180
Minnesota	28,053	36,157
Mississippi	0	5,886
Missouri	5,720	54,082
Montana	89,574	562
Nebraska	909	20,436
Nevada	3,416	119
New Hampshire	4,322	5,166
New Jersey	143	101,478
New Mexico	53	1,524
New York	227,033	382,108
North Carolina	53,035	10,956
North Dakota	0	2,732
Ohio	1,490	258,432
Oklahoma	217	17,287
Oregon	32,278	7,845
Pennsylvania	45,324	329,392
Rhode Island	355	37,114
South Carolina	61,911	5,825
South Dakota	477	3,327
Tennessee	39,443	9,233
Texas	74	55,397
Utah	13,932	0
Vermont	15,430	786
Virginia	13,801	30,423
Washington	103,981	4,480
West Virginia	1,775	95,306
Wisconsin	35,443	37,451
Wyoming	152	4,785
Total	1,274,401	2,580,198
Total, by water power and fuels		3,854,599

* Compiled by Division of Power Resources, United States Geological Survey

George Otis Smith Approves of Seasonal Coal Rates

GEORGE OTIS SMITH, director of the Geological Survey, commenting on proposed seasonal coal rates, said: "I often have put it before engineers that what is proposed in the way of seasonal coal rates is the most promising method of improving the load factor of the soft-coal industry, and incidentally, of helping in our great transportation problem of moving too much freight with too little equipment. I recently have figured the increased burden put upon our railroads by the whole mineral industry as 3,000,000 carloads a year, comparing the years 1913 and 1918."

The National Coal Association is leaving to the local associations such presentations as they may care to make in regard to the seasonal coal rates. Since such rates will affect each district differently, it was thought not to be a matter in which the national association could take a position.

Engineers and Railroad Presidents Study Stabilization of Coal Industry

Committee Is Appointed to Present to the Senate a Substitute for the Frelinghuysen Seasonal Freight Rate Bill —Storage of Bituminous Considered To Be Practicable

A PRELIMINARY conference at which the stabilization of the bituminous industry was the chief topic of discussion was held at the headquarters of the American Institute of Mining and Metallurgical Engineers, New York City, on April 6. It was attended by a committee of railroad presidents representing the American Railway Association and the Coal and Coke Committee of the institute. Herbert Hoover, president of the institute, presided.

Engineers get behind movement to stabilize bituminous-coal industry and offer constructive suggestions to improve labor and transportation conditions. Railroad presidents lend counsel and offer to assist, but it is apparent that there is a limit to what suggestions can do. Read this and figure out where and how you can help the cause along.

One definite result of the conference was the appointment of a committee to appear before the committee of the Senate having in charge the Frelinghuysen bill on seasonal freight rates and to present a substitute bill. While the meeting was in favor of seasonal freight rates, it did not believe that the bill now under consideration covers the subject in a complete enough manner. This committee, appointed by President Hoover, consists of S. A. Taylor, Eugene McAuliffe and E. W. Parker.

The storage of coal during the summer months for use in the following winter, the stabilization of labor, the better control of mining by greater employment of engineers, with suggestions as to how the numbers of engineers available for this work might be increased, and coal economy were other matters discussed.

Samuel Rea, president of the Pennsylvania system, was the chairman of the committee representing the American Railway Association. The other members of the committee were F. D. Underwood, president of the Erie R.R. Co.; A. T. Dice, president of the Philadelphia & Reading R.R.; E. J. Pearson, president of the New York, New Haven & Hartford R.R., and C. H. Markham, president of the Illinois R.R., who was represented by J. F. Porterfield of that company.

Railroads Discuss Summer Storage

The summer storage of coal by the railroads was discussed fully by the conference from the viewpoint of both the railroads and the operators. The discussion was extremely helpful in giving a better understanding of the difficulties to be overcome and the part the railroads can play in the solution of the problem of stabilization.

The Committee on Storage of Coal reported that storage of bituminous coal is practicable beyond doubt. It has been successfully carried on for years on a large scale at the docks on the Great Lakes, in New England, at many industrial and public utility plants throughout the country, at the Panama Canal, and at many of the Government bases of supply. For the domestic trade, the committee said, the best storage is in the bin or cellar of the consumer, and consumers should be encouraged by every means possible to purchase their winter's supply early in the preceding season.

So far as the domestic consumer is concerned, the cost of doing this would be practically nothing, and if a reduction in price or in freight rates were made practically all the reduction would represent a gain to the consumer. The committee told the conference that the chief points in favor of the storage of coal were fully set forth in the paper on the subject read by Prof. H. H. Stoek at the February meeting of the institute and in the majority report of the United States Coal Commission, which awarded a 27-per cent increase in wages to the bituminous mine workers.

Including all charges excepting degradation, the cost of storage in well designed plants should not exceed from 30c. to 50c. a ton, and where used for steam or coking purposes, the degradation would be of no consequence, as the heat value of the coal, or its value for coking, would not be appreciably affected.

Seasonal prices and a proper adjustment of freight rates to encourage delivery and buying during the spring and summer months will be large factors in the storage of coal, and the committee believes that prompt action that will result in bringing these matters to the attention of the public will be of great help. It believes that publicity and an educational campaign should be started through the Council of National Defense, the various coal associations and by every other agency possible. This publicity campaign should emphasize the importance of stabilizing the industry, helping the railroad situation, bettering the working conditions of the miner and the benefit to be derived by the consumer.

With regard to the suggestion of Governor Harding of the Federal Reserve Board that loans might be made against coal in storage under certain warehousing restrictions, it was thought that while these restrictions were perhaps suitable for other commodities as they stand, they might be prohibitive for the storage of coal. It was believed that if the situation were properly presented to the Federal Reserve Board modifications might be obtained which would make the rulings more favorable to application to the storage of coal. If this is done it should remove the one great objection to the storage of coal, viz., the amount of capital tied up.

To obtain the engineering talent needed in the bituminous industry it was the belief of the conference that

the operators must make the first move by establishing scholarships in technical schools having mining courses. If the operators can be induced to establish such scholarships they should be awarded to the sons of mine employees who have the necessary preliminary education and who show talent and predilection for the profession.

More and better engineers are needed in the bituminous industry, and to secure this additional help now it was suggested that there be a consolidation of the engineering work of regions, districts or groups of operators on the lines already adopted in safety work, thus making available the talent obtainable and increasing the efficiency and reducing the cost of engineering work.

An extended publicity campaign of the facts already available concerning the economical use of fuel for heat, light and power was advocated by the Committee on Conservation in the Use of Coal. Some of the important points brought out by the Committee on Economy in Coal Consumption Through Electrification of Industries and Railroads were:

Electricity is the most efficient agency for power distribution. Power in the form of coal is maximum in bulk and minimum in efficiency. Power in the form of electricity is minimum in bulk and maximum in efficiency.

Within the territory of the so-called Boston-Washington zone there is consumed 40 per cent of the total coal produced. The area of this zone is less than 5 per cent of the total area of the United States.

Coal represents 30 per cent of the total freight tonnage transported by the railroads. In congested districts this rises to 40 per cent.

The yearly load factor in the above zone today is not greater than 15 per cent, and the coal consumption is in excess of four pounds per kilowatt-hour. The machine capacity is seventeen million horsepower; ten millions at industrial plants and seven millions on railroads.

The present coal consumption can be reduced one-half and machine capacity conserved to the extent of threefold in this zone through the adoption of a super-power system or systems, which, briefly described, consist of large high economic steam electric stations erected at tidewater and at the mouth of mines, both supplemented by hydro-electric stations constructed on the rivers, all interconnected with a high voltage system of transmission and distribution. The amount of money required to construct such super-power systems will be very much less than that required for the expansion of the present relatively small systems. The committee proposes that coal be transported by preferred routes from the mines to tide and thence to the power stations by ocean tugs and barges, thus relieving the railroads of this burden.

In conclusion the committee says that the country's prosperity depends upon its ability to speed up production, and in order that it may do so, the essential associates of production—power and transportation—must be provided. The method outlined, the committee says, while furnishing adequate power will automatically serve to greatly facilitate transportation.

During the conference President Hoover appointed the following committees:

Committee on Conservation in the Use of Coal—L. P. Breckenridge, David Moffat Myers, R. M. Atwater.

Committee for Stabilization of Labor—S. A. Taylor, E. W. Parker, Rembrandt Peale.

Committee on Storage—H. H. Stoek, George S. Rice, Howard N. Eavenson, H. N. Shenton.

Committee for Co-operation with the Railroads—J. D. A. Morrow, Eugene McAuliffe, J. G. Puterbaugh, C. E. Lesher, Edwin Ludlow.

Committee on Economy in Coal Consumption Through Electrification of Industries—W. S. Murray, W. S. Barstow, George Otis Smith, E. R. Welles.

Committee for Better Control of Coal Mining Through Greater Employment of Engineers—R. V. Norris, James H. Allport, Erskine Ramsay, Van H. Manning, L. E. Young.

Harlan and Hazard Operators Seek Better Car Service

Bring Action Before Interstate Commerce Commission Requesting That Body to Compel Railroads to Restore Cars to Louisville & Nashville

FINDING that the Louisville & Nashville Railroad Co. has been deprived of its open-top cars by the railroads with which that company's lines are connected, the Harlan County Coal Operators' Association, the Hazard Coal Operators' Exchange, the Southern Appalachian Coal Operators' Association and the West Kentucky Coal Bureau have made complaint to the Interstate Commerce Commission, in which the Louisville & Nashville Railroad Co., et al., are defendents.

The complainants state that the mines served by the Louisville & Nashville R.R. in the States of Kentucky, Alabama, Tennessee, Illinois and Virginia produce annually 23,000,000 tons of bituminous coal, of which about 17,000,000 tons are mined and shipped from mines located in the States of Kentucky and Tennessee. Of the total annual production of 23,000,000 tons of coal, between 3,000,000 and 4,000,000 tons are taken by the Louisville & Nashville Railroad Co. for its own fuel requirements, and of the commercial coal which constitutes the remainder fully 65 per cent is marketed at points on or reached by railroads connecting with the Louisville & Nashville Railroad Co. These connecting carriers have not been for many years returning Louisville & Nashville coal cars promptly, and the outcome has been that mines along that railroad have been supplied with an inadequate number of cars for the loading of coal.

Since the strike of the bituminous coal miners, which ended on Dec. 13, 1919, the coal-car supply, according to the complainants, has become worse. The Louisville & Nashville Railroad Co. furnished its mines during the month of March, this year, only 46.85 per cent of the empty coal cars ordered, which is approximately 10 per cent less than during February of this year, which was the month of the greatest shortage of coal cars on the Louisville & Nashville R.R. lines up to March 1, 1920.

The complainants declare that the Commission on Car Service appointed by the American Railway Association issued an order to the connecting lines to deliver to the Louisville & Nashville Railroad Co. each day 245 more empty coal cars than they received loaded coal cars from the Louisville & Nashville Railroad Co., specifying where the empty coal cars should be delivered by each line. During the period March 20-28 of this year, inclusive, there became due under said order to the Louisville & Nashville Railroad Co. 4,619 coal cars at the various junctions specified by the

Commission on Car Service, with the natural outcome that since that time the supply of coal cars has been much worse than before, which demonstrates that the orders of the Commission on Car Service, which body has no mandatory powers, have not received serious consideration, and certainly have not been observed by lines connecting with the Louisville & Nashville Railroad Co. with whom the orders were filed.

Past experience has demonstrated that unless the Louisville & Nashville R.R. has in its possession the equivalent of 83 per cent of its ownership of coal cars mines cannot be furnished with even a reasonably fair supply of cars.

The complainants address the prayer to the Interstate Commerce Commission, asking that the commission recognize the present shortage of equipment and the emergency existing at mines served by the Louisville & Nashville Railroad Co. and that peremptory orders be issued requiring defendant carriers to return promptly to the Louisville & Nashville Railroad Co. the open-top cars belonging to that company now in their possession. They request that the commission make effective the order of the Commission on Car Service just referred to, and take such other action as in the opinion of the commission would best meet the emergency and serve the public interest.

Strike Curtailed Washington State Production

State Mine Inspector Gives Statistics for 1919, Showing a General Decrease in Coal and Coke Output

THE strike of coal miners last year curtailed production in the State of Washington approximately 25 per cent, according to the annual report of James Bagley, state inspector of coal mines, which has just been forwarded to Governor Louis F. Hart. Coal production for the year 1919 was 3,059,580 short tons, as compared with 4,128,424 tons in 1918, a reduction of 1,068,844 tons.

"British Columbia coal has always been a factor in the Washington market, and during the last two years shipments of coal to this state from Utah and Wyoming have increased materially," says Mr. Bagley. "It looks as if the commercial mines of the state will work only half time during the summer months, making the present year one of the most unsatisfactory the coal industry has had in recent years.

"While fuel oil, which replaces coal as fuel on many of the railroads and steamers of the Pacific Coast, has advanced in price materially during recent years, the selling price of coal also has advanced, due to the high cost of production.

"The substantial advance in wages paid to miners in the last few years and the high cost of material have prevented coal from replacing fuel oil to a great extent. Electricity is replacing many thousand tons of coal in the State of Washington. The Chicago, Milwaukee & St. Paul R.R. is now using it exclusively on the division from Seattle to Othello, Wash."

The coal-producing counties of the state, with the exception of Whatcom county, showed a decrease. In Whatcom county an increase is shown due to the operation of the Bellingham mine, which was under development most of the year.

The national coal strike closed down the mines of the state from Nov. 1 to Dec. 15, 1919, and the mines of Kittitas county did not resume operations until December 23.

Mr. Bagley's report also shows nineteen fatal accidents in Washington coal mines last year, fourteen of which occurred inside of the mines and five outside. The amount of coal mined per fatal accident was 161,030 tons, and 3.79 persons were killed per 1,000 men employed in the industry. "The state has gone about as far as is possible in passing laws to safeguard the mine workers," says Mr. Bagley. "Education of the mine worker and mine official to 'think safety' and avoid danger is the only way accidents can be reduced."

The state reached its maximum coal production in the month of October, when the mines were rushed with orders on account of the impending strike. In that month 4,760 employes working 26.3 days produced 373,198 tons of coal. During part of the year, especially from February to July, many of the miners were idle part of the time due to lack of demand for coal. The average value per ton at the mine was $3.59 in 1919, compared with $3.53 in 1918. Total value at mine was $10,997,733.

The coke output for the state also shows a large decrease during the last year, the report shows. The output of coke for 1919 was 65,332 tons, as compared with 144,349 tons for the previous year, a decrease of about 55 per cent. Of the total output 35,888 tons was manufactured at the coke ovens at the mines located at Carbonado, Fairfax and Wilkeson. The remainder was manufactured at the plants of the Seattle Lighting Company at Seattle and the oven operated by M. S. Allison Co. at Croker, near Carbonado. The total value of coke at the ovens was $565,356 and the average value at the ovens, $8.65.

"The reason for the decrease in the coke output is that less coke is being used at the Tacoma smelter than formerly and there is less demand for Washington coke from smelters located in British Columbia," says the report. "The exports of coke to British Columbia show a gradual decrease during the last few years.

"During 1916 the exports of coke to British Columbia through customs district No. 30 were 47,560 tons. The exports for 1919 were 1,431 tons. British Columbia is now manufacturing practically all its own coke, which accounts for the decrease in demand for Washington coke. With the large decrease in output during the last year the future of the coal mining industry of the state is problematical."

Commission to Adjust Wages and Working Conditions in Washington State

FOUR members of the coal commission, who, with a fifth member to be selected by themselves, will review the coal mining situation in the State of Washington, with a view to covering working conditions and wages and act as an arbitration board, recently met in the offices of the Washington Coal Operators' Association, 608 Lyon Building, Seattle.

The commissioners are N. D. Moore, acting representative of the mine operators; D. F. Buckingham, general manager of the Roslyn Fuel Company, representing the mine owners, and Robert S. Harlin, president, and Ernest Newsham, secretary of District No. 10,

United Mine Workers of America, representing Washington miners. The four will select a fifth member, who must be a mining engineer of experience.

The commission was provided for in a government plan developed after last winter's strike. The wage findings did not affect Washington and provision therefore was made for the commission. The commissioners did not expect to do more than hold a preliminary discussion of the problems confronting them.

To Investigate Alaska Coal For Navy's Use

Engineers Deny Reports That Cost of Mining and Transporting Fuel for Pacific Fleet Would Be Greater Than from West Virginia

IT IS the intention of the Navy Department to make a thorough investigation of coal in Alaska suitable for navy use. The work is to be begun immediately after July 1, when the appropriation of $1,000,000 for that purpose becomes available. Plans have not been completed but are being discussed by representatives of the navy, the Bureau of Mines and the Geological Survey. The Secretary of the Navy has announced his intention to send a geologist, an engineer and a naval officer to Alaska, and it is probable that they will undertake extensive prospecting with the idea of determining something of the extent of coal in the Matanuska field suitable for the navy.

Secretary Daniels admits that some reports have reached him to the effect that the cost of mining and transporting coal from Matanuska for the Pacific fleet will be greater than the cost of West Virginia coal brought through the Panama Canal to Pacific stations. He points out, however, that the reports made to him by the engineers who have actually investigated the coal are quite different. The Secretary called particular attention to the conclusions of a commission headed by Captain Kittell. In its report to Secretary Daniels the Kittell commission said in part:

From its investigations this commission draws the following conclusions and indicates various lines of procedure that may be undertaken by the department in order to locate, mine, transport to seaboard and ship coal for use of the navy, viz.:

That there is sufficient coal of navy quality underlying the Matanuska region to warrant definite and active development.

That the whole Matanuska region, beginning with the Chickaloon section, should be thoroughly and scientifically investigated by a force of mining engineers and geologists, by means of diamond drilling, shaft sinking, tunnel and slope driving, to ascertain the quantity of navy coal present in the earth strata and to determine the best practical and economical method of mining this coal.

Organize an expedition with mining engineers and geologists, together with all necessary apparatus and helpers, to thoroughly examine leasing units Nos. 8 to 15, inclusive, and definitely determine what quantity of navy coal is present and how it lies relative to the surface. In the meantime these leases should be set aside for the use of the Navy Department. At present leasing units Nos. 10 and 11 are held by the Chickaloon Coal Co. and leasing unit No. 12 by the Alaskan Engineering Commission. It is believed that the Chickaloon Coal Co. will be willing to part with its lease for a consideration.

Having determined the amount of navy coal present in leasing units Nos. 8 to 15, both inclusive, proceed to mine the same, providing necessary equipment, labor and transportation facilities to the railroad.

Under the department's instructions two plans are considered for getting coal from the Matanuska mines, transportation to the seaboard and loading it upon naval vessels. These plans are:

1. Mine coal at Chickaloon mine (leasing unit No. 12), other mines to be opened later, and pending the development of some other port of shipment (*a*) to temporarily utilize Anchorage during the open season of the year, using present facilities, including the deep-water pier and wharf which are in process of construction, including a temporary coal-loading apparatus which the Alaskan Engineering Commission intends to construct upon the deep-water wharf. This calls for relatively slight expenditure by the navy and can be put into operation without any loss of time; (*b*) utilize Anchorage as as permanent shipping port during the open season, and erect there such navy terminal facilities as may be necessary for the shipment of coal.

2. Mine coal as in plan 1 and transport it over the railroad to Seward. Utilize Seward (*a*) as a permanent port of shipment for navy coal throughout the year, or (*b*) so utilize it only during the season when Anchorage is closed. Construct at Seward (1) the necessary coaling plant on the Naval Reservation and connect the same with the railroad, or (2) construct the necessary coaling plant on the eastern water front of the Seward town site.

The present naval commission has also incorporated a third plan: Mine coal as in plan 1 and transport it over the railroad to mile 64; build a railroad from mile 64 of the present road over a distance of 11.4 miles to Portage Bay, on Prince William Sound, Alaska, and there construct wharves and a coal-handling plant. Coal could then be delivered by railroad direct from the mines to Portage Bay quickly, cheaply and over negligible grades for the all-year-around shipment of navy coal.

There is no doubt in the minds of Secretary Daniels and of the engineers and geologists of the Interior Department who are familiar with the coal already prospected in the Matanuska field that it will meet the navy's requirements. In fact, an actual test was made some years ago on the Battleship Maryland, and the results were entirely satisfactory.

Government Salaries Too Low to Attract Engineering Graduates

ON ACCOUNT of serious difficulty in filling vacancies in its engineering staff the U. S. Geological Survey recently sent out a letter to twenty-one engineering schools calling attention to a civil service examination which may be taken by senior students who expect to be graduated this year. The salary of these positions is $1,200 per year.

The presidents of most of the schools stated that they would post the notices and call the students' attention to the matter, but expressed grave doubts about their being interested in such positions. One reply contains this statement: "In view of the number of more attractive openings which are abundant at this time, I do not anticipate that many of the young men will seek positions with the Government where the opportunities for rapid promotions are less than in a number of industrial lines at the present."

Another states that "it will not arouse much interest on account of low entrance salaries," and still another calls attention to the fact that men with such qualifications find "no difficulty in getting $1,800 per year."

Yale University calls attention also to a recent civil service examination announcement for the position of highway engineer at $1,800 to $2,400, the specifications for which call for "at least five years' responsible experience." The letter further states that "we do not know of a man who has been out of college long enough to meet these qualifications who would accept such a salary." A man with such training and experience, they assert, "probably would be rewarded in business by a salary of not less $4,000."

It is evident that any candidates certified as a result of these examination announcements will not be up to standard.

NEWS FROM THE CAPITOL

BY PAUL WOOTON

Hines Resigns Office of Rail Director

WALKER D. HINES has resigned the office of Director General of Railroads and President Wilson has accepted his resignation, effective May 15. The work of settling the affairs of the Railroad Administration will be assumed by Mr. Hines' successor.

Max Thelen, now in charge of the claims department, probably will be named. Mr. Hines is said to favor his appointment and news from the White House is to the effect that the retiring director will name his successor.

Mr. Hines is reported as having contemplated returning to the practice of law in New York with the return of the railroads to private control. It is likely, however, that he will take a vacation abroad immediately upon retirement from office.

In accepting the Director General's resignation President Wilson wrote Mr. Hines that he had "personally valued and admired the quite unusual services you have rendered the Government and the country."

Mr. Hines has served with the Railroad Administration since its creation in December, 1917, when the Government assumed control of the railroads of the country. He was appointed then as Assistant Director General, and when Secretary McAdoo retired to private life on Jan. 11, 1919, Mr. Hines was made Director General.

Secretary Daniels Seeks Competitive Bids In Supplying Navy Coal

IN AN effort to get away from obtaining coal under navy orders, Secretary Daniels has issued a statement in connection with a notice that bids will be reopened May 18 for the Navy's coal requirements, in the hope that the practice of awarding contracts after competitive bidding may be resumed. In his statement Secretary Daniels says:

"Because of the failure to receive satisfactory bids for naval coal requirements, and in keeping with advices received that a reopening of bids would result in more satisfactory tenders, proposals are again issued under an opening set for May 18, 1920, at 10 A. M.

"This decision is also prompted through the desire to return to the practice of awarding contracts after competitive bidding, thereby making it feasible to discontinue obtaining deliveries under navy orders; although the latter must, of course, be continued in effect until provision of the required needs can be assured.

"In this connection, and for your information, it is considered desirable to advise that of a total of about 2,300,000 tons of bituminous coal and 60,000 tons of anthracite coal on which bids were invited, quotations were offered on only 522,300 tons of bituminous coal and 25,400 tons of anthracite coal. Of this tonnage it appears that it will be practicable to accept 108,000 tons of bituminous coal and 21,700 tons of anthracite coal; furthermore, only a very few points of those at which deliveries were called for were covered in the bids received, and then for but an inappreciable quantity of the coal needed.

"In the absence of information to the contrary, it is assumed that the form of proposal issued is in general satisfactory, the periods of delivery as specified contemplating either fractions of a year or annual contracts. If however, because of uncertainty of conditions, a modification in the period for which contract is to run is desired, bids for different periods will be considered.

"Attention is again invited to the desire to comply with the recommendations of the Bituminous Coal Commission that storage space be stocked during the summer months."

Appropriation Needed for Payment for Cars Requisitioned by Fuel Administration

IN a letter to Senator Frelinghuysen in regard to Fuel Administration claims the Secretary of Interior says:

"For your information, I beg to advise that some three hundred carloads of coal have been traced and settlement arranged for. Vouchers to the number of one hundred for supplies, stationery, equipment, freight, expressage, telegrams, etc., amounting to $3,170.99, have been approved and forwarded to the auditor for the State and other departments to give preference and to expedite payment.

"There is another class of claims which are coming for which we have no appropriation—for cars shipped under requisition of the Fuel Administration and remittance made for less than the invoice price because of a lack of hauling or other charges and other matters of this general character. It is suggested that we let these claims accumulate until December and then report them to Congress for an appropriation."

Government Coal Yard Opens Bids

Bids for coal for the Government departments in Washington for the coal year beginning April 1. 1920, were opened on April 12 by the chief engineer of the Government fuel yards. Requests had been made for proposals either to furnish coal for the coming three months or for the entire coal year, the total estimated need being in excess of 300,000 tons. Only three bids were received, for a portion of the quantities desired in each case.

None of the bids has been accepted, and, because of the limited quantity offered, it is doubtful whether a decision can be reached in the immediate future.

Senate Commerce Committee Hears Arguments On Seasonal Freight Rates

Despite Opposition Senator Frelinghuysen Refuses to Believe His Plan Unwise—McAuliffe Enumerates Advantages, but Snider, Representing Railroads, and Hurd, for Operators, Vigorously Oppose Proposal

OPPOSITION to legislation providing for seasonal coal rates developed in unexpected volume at the hearings being conducted by Senator Frelinghuysen's sub-committee of the Committee on Interstate Commerce. Despite the wave of opposition it is apparent that Senator Frelinghuysen has not been convinced by the arguments thus far advanced that his proposal is unwise. Apparently he is willing to accept the suggestion of the committee of the American Institute of Mining and Metallurgical Engineers, which advocated a tonnage basis for additions and deductions from the rate which would be graduated.

G. N. Snider says that there will be no surplus of open-top equipment this year, and maybe not for three years to come. He thinks seasonal freight rates on coal should not be tried just to see what will happen, but only after thorough investigation by the Interstate Commerce Commission has indicated that they would be advisable.

In the original Frelinghuysen bill the addition to the rate was to be 15 per cent above the existing rate beginning with Sept. 1. The fact that a 15-per cent deduction from the existing rate is provided during the period from April 1 to Sept. 1 would mean a difference of 30 per cent in the charge made for transporting coal as between Aug. 31 and the day following.

Various abuses and evils which would arise from such an abrupt change were pointed out at the hearing by Eugene McAuliffe, who testified as the representative of the American Institute of Mining and Metallurgical Engineers. The fact that he had been in charge of the coal conservation division of the Railroad Administration enabled Mr. McAuliffe to bring out many points of his own experience in support of his argument for seasonal rates.

Seasonal rates, Mr. McAuliffe pointed out, were to be regarded as the natural complement of seasonal coal prices. The strike of Nov. 1 had its chief cause, in Mr. McAuliffe's opinion, in enforced idleness during the spring and summer of 1919. He pointed to the absolute necessity of providing for continuous operation of coal mines, not only in the interest of the mine workers but in the interest of lowering production costs and in providing continuous employment for railroad equipment designed to handle coal. In the normal year uniform production throughout the twelve months automatically would provide one hundred thousand coal cars.

Mr. McAuliffe declared that the coal industry has been kept on the brink of a cataclysm through lack of stabilization and from the tendency of the American coal consumer to buy on a hand-to-mouth basis. With one-half the coal reserve of the world the United States, in the opinion of Mr. McAuliffe, should put the industry on a high national plane. He pointed out that the United States must furnish more coal for other countries. The need for an orderly production of coal for domestic and export consumption is increasing more rapidly than had been expected, because of the prospect that little fuel oil will be available in the future for steam-making purposes.

Mr. McAuliffe pointed out that the rates in no way would embarrass the railroads and should be of great help to them in reducing by many millions of dollars the investment in equipment necessary to handle the year's coal in five months. The plan of having graded fluctuations, measured in cents per ton, would mean the same revenue to the railroads, but, he pointed out, it would be entirely possible to exempt certain coal from the operation of the seasonal rates.

He suggested that coal for lake shipment and a portion of the tidewater tonnage could well be exempted. He also expressed surprise that there was opposition on the part of the operators, many of whom have changed from warm advocates of the seasonal rates to vigorous opponents of the plan. He expressed the opinion that this change must have been promoted by some belief that local or individual losses would result. It is his opinion, however, that the Interstate Commerce Commission can be relied upon to adjust any local irregularities.

At that point in Mr. McAuliffe's testimony Senator Frelinghuysen asked if the change of heart on the part of the operators could have been caused by the desire to obtain scarcity prices. Mr. McAuliffe replied that it unfortunately is true that a minority in the coal trade look upon coal as something with which to speculate and probably prefer present conditions to those which would make for a stable profit.

One of Mr. McAuliffe's important points was the economic wrong in transporting the bulk of the nation's coal when the actual cost of transportation is 35 per cent higher than in the summer months. He classed the coal industry as next in importance to agriculture. We have reached a point in our national development, he asserted, which justifies the public in demanding an improvement in the coal situation. He urged that this demand be met by voluntary effort.

Unless something is done to better conditions he predicted nationalization of the coal mines within a few years. Since he feels sure that nationalization would not bring the relief which the public expects, he urged that selfish considerations be disregarded rather than that the industry drift into that whirlpool.

The hearing revealed that Commissioner Clark of the Interstate Commerce Commission is of the opinion that the railroads now have sufficient cars to handle the country's coal requirements comfortably if the distribution can be spread over the twelve months.

G. N. Snider, who was later described as one of the best witnesses who ever appeared on Capitol Hill, pre-

sented the views of the railroads in the territory east of the Indiana line and north of the Carolinas. His argument was that there is no necessity for legislation, at this time at least, because there is certain to be no surplus of open-top equipment this summer and possibly will not be for three years to come. The railroads, he said, have no objection to the Interstate Commerce Commission requiring seasonal rates if they should seem advisable after a thorough study has been made of their effects, but there is objection to putting these rates into effect with the idea of seeing what will happen.

This year, in order to get the production the country needs, Mr. Snider pointed out, everything must be done to increase the handling of coal cars. Obviously it is unnecessary to make a reduction of the rates on coal moving to lake ports and to tidewater. If reductions were made to all rail destinations from the fields serving the lakes and tidewater the effect, in Mr. Snider's opinion, would be to take cars from an efficient lake and tidewater trade to put in the all-rail trade.

Vigorous opposition to the seasonal rate proposal came from the owners of the docks at the head of the lakes. It was pointed out that the low summer rate would enable a much larger quantity of Illinois coal to move into the territory which they are serving. At the same time a considerable portion of the distribution from the docks would have to be made when the high rates were in effect. This combined with the suggestion that the coal movement to Lake Erie ports be exempted from the low summer rate would constitute unjust discrimination against the owners of the docks.

D. F. Hurd, the secretary of the Pittsburgh Vein Operators' Association of Ohio, appeared in opposition to the bill. His testimony brought out that the members of his association believe that seasonal rates would:

(1) Precipitate chaos in the coal rate structure and, viewed under the present "Act to Regulate Commerce," result in discriminatory and unfair rates.

(2) It could not be made effective without a serious disturbance in differentials, which differentials have been arrived at after many investigations by the Interstate Commerce Commission and which differentials must be maintained to provide equity between coal-producing groups and fair and reasonable rates to consumers.

(3) Create more long-haul traffic and in consequence decrease car efficiency.

(4) Decrease the earnings of some railroads and enhance the earnings of others, neither of which could be foreseen, and therefore would be uncertain as to future effect.

(5) During low-rate period decrease car supply at the mines by reason of the temptation to supply cars preferentially for the more attractive 100-per cent rate traffic for which open-top cars may be utilized. During high-rate period increase car supply at mines because of the premium rate on coal traffic.

(6) Discourage purchase and delivery of coal in the period immediately preceding the reduction, the difference in a 15-per cent reduction being 30 per cent in the rate as between March 31 and April 1, when the rate increase period becomes effective.

(7) Create excessive demand for delivery toward the end of the low-rate period, viz., the month of September far beyond ability of the carrier to provide cars.

(8) Create heavy demand for delivery of railroad fuel during low-rate period, especially for railroads obliged to obtain their coal from mines located on other roads, in order to prevent penalty in freight charges during high-rate period.

(9) Cause excessive delivery on contracts during low-rate period beyond ability of producer to supply, or if able to supply, deprive other than contract buyers of delivery during low-rate period.

(10) Create conditions where lake shippers, obligated for heavy tonnage during season of navigation, would be unable to provide industries within their usual marketing field with coal for storage during low-rate period, or if dividing the tonnage, fail to supply Northwestern markets during season of navigation, the deficiency to be made up via all-rail movement during the higher-rate period with a tremendous loss of car efficiency due to the time occupied in movement of cars from mine to the Northwest during the winter season instead of from mine to the lower lake ports during the season of navigation.

(11) Force many industries during lake season to take coal of a quality unsuitable for their purposes, or wait until the lake season is over and then pay the penalty freight rate.

Other points brought out by Mr. Hurd follow:

Dealers will be unprepared to carry any considerable tonnage beyond the amount usually carried, although upon the dealer depends the supply for buildings, apartment houses, hotels and domestic use, and small industries where no storage is available.

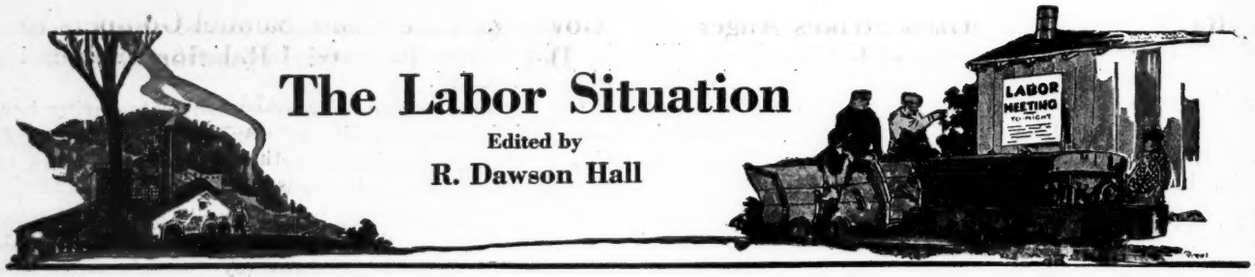
Many industries now stock and store coal up to storage capacity. Others do not have nor can they procure storage space. Without exception these industries consume vastly more coal in winter and accordingly the greater portion of their coal would move in the high-rate period.

Domestic consumers of bituminous coal in markets reached by these producers represent less than 5 per cent of the production and if all could and would store during the low-rate period, the volume of tonnage distributed among all of the railroads would be insignificant.

Seasonal rates as proposed would destroy markets that the producer has created under the protection of the Government through the "Act to Regulate Commerce," which has justified him in an investment to provide facilities for handling and storing lake coal at northern points, insuring to him just and reasonable and non-discriminatory rates, and the final purchaser and consumer of that coal may justly claim these same rights and the benefits resulting to him therefrom.

The position of the coal operators in the East who are opposed to seasonal freight rates was presented by D. F. Hurd, secretary of the Pittsburgh Vein Operators' Association of Ohio. Mr. Hurd holds that the scheme is not practical, would result in discriminatory and unfair rates and lower car efficiency.

"The honorable chairman of the Interstate Commerce Commission," said Mr. Hurd, "in a communication to Senator Frelinghuysen has expressed the opinion that under the present 'Act' the commission is not authorized to prescribe seasonal rates. Our views are fully in accord with his."



The Labor Situation

Edited by
R. Dawson Hall

Northern West Virginia Miners Get Big Wage Increase

Difficulties were expected in the making of an agreement between the mine workers and operators located in the northern West Virginia fields, which region forms District No. 17 of the United Mine Workers of America, but on April 17 a contract was concluded, thus closing more than a week's discussion.

When the scale committee assembled at Baltimore it found the mine workers seeking an increase of 40 per cent over the wage paid under the October wage scale. It was, however, the consensus of opinion that the differences would all be adjusted and an agreement worked out, though not on the basis proposed by the miners. In the upshot the mine workers received a new scale virtually 45 per cent higher than before. The miners get a flat increase of 24c. per ton over present rates. The rate was 63.7c. per ton and it is now increased to 87.7c.

The sub-committee of operators and mine workers designated to draft the scale consisted of Brooks Fleming, Jr.; E. M. McCullough, Percy Tetlow, E. Drennen, C. J. Ryan, C. H. Tarleton, J. A. Clarke, Jr., S. D. Brady, George Devers, J. F. Forenash, E. W. Rockerstein, R. M. Williams, C. C. Montgomery and George S. Brackett. The new scale will affect about 27,000 mine workers and 750 mines in northern West Virginia. These men work in twelve and a half counties of the state.

Anthracite Mine Workers Reduce Their Wage Demands

After many sessions lasting since March 9 and bringing no concessions from either party except an undertaking on the part of the anthracite operators that that they would date the wage increase from April 1, a break took place on the part of the representatives of the anthracite mine workers and so brought the meeting of the subcommittee on the wage scale measurably nearer to an agreement.

Seeing the mine workers had so long stood for a 60 per cent increase for contract miners, a $2 a day increase for day men, a six-hour day and a five-day week it is surprising and comforting to know that on Saturday, April 24, they modified these demands asking only a 27 per cent increase for contract workers, a $1 per day increase for day men and agreeing to go on with the eight-hour day.

Thus the anthracite mine workers go back to the rate of increase and the working conditions prescribed by the Bituminous Coal Commission for the workers in soft-coal mines. No change was made in the remaining demands which cover working conditions, payment for dead work and several other details.

The statement given out at the conclusion of the day's session said:

"At the session of the Sub-Committee of Anthracite Operators and Mine Workers held today the mine workers' representatives offered two substitutes for two of the original demands presented:

"As a substitute for demand No. 2, calling for a 60 per cent increase in contract rates and $2 per day increase to day men, the following was offered: We demand that the present wages of the anthracite mine workers be increased to correspond to the increases granted the bituminous mine workers by the Presidential Coal Commission.

"As a substitute for demand No. 4, calling for a work day of not more than six hours from bank to bank, the following substitute was offered: We demand that the eight-hour day be extended to all classes of inside and outside day labor and monthly men, with time and half time for over-time and double time for Sundays and holidays.

"Upon presentation of the modified demands the operators' representatives requested an adjournment until Monday. The Committee will meet Monday." But Monday saw no change. The wage demands as modified were discussed but without any issue. However, the situation has changed for the better and a settlement cannot be far off.

It would be merely trying the patience of the reader to record all the reports made by the subcommittee during last week's conference other than that of Saturday, for Saturday's session easily dwarfed all those that preceeded it both last week and since March 6.

Hicks Interests Sign Wage Contract

No mining properties along the Kiskiminitas River are more important than those of the Hicks interests. These companies operate nineteen thin-vein properties. They have arrived at an agreement with their men, the scale providing an increase of 24c. per ton and a flat advance to their daymen of $1 a day.

Radicals To Be Kept Down in Ohio

In order to keep Industrial Workers of the World out of the union, sub-district 5 of district 6 (Ohio) in its conference which closed on April 17 after a six-day session voted to bar anyone from office who had not been five years a member of the organization. This vote was one of the most interesting and significant developments of the 22d session of the sub-district. The region unfortunately contains a number of "I Won't Works" and has suffered from sporadic strikes started solely to prevent the execution of Thomas Mooney for participation in the outrage on a procession in California.

Ray Says Unauthorized Strikes Anger Public and Impoverish Miner

THAT frequent strikes over trivial differences such as have been witnessed in the eastern Ohio fields in recent months are alienating public opinion, was the declaration of President William Ray of the fifth sub-district of Ohio toward the close of his annual report in opening the 22nd annual convention of the sub-district. He expressed fear that if such strikes were continued the mine workers' interests would suffer. The text of that portion of the president's report dealing with strikes is as follows:

"Strikes are becoming so common in our sub-district that I fear the final results. Long years have we contended that all labor employees in an industry should be organized under one head as we are. I believe it will get us the best results, but when so organized if one branch of labor can and does strike every time something happens that it doesn't like, thereby causing all the others to lose time, we shall draw perilously near the shores of danger. It has been that way in our union during the past months. I sound the warning. Our frequent strikes are not doing us any good but are keeping from making a daily wage many and many a man who is in need of it. Not only that but it is the thing which is turning public opinion of the great mass of people against the mine worker, and it is the judgment of the public that finally determines all questions in a country such as ours."

Try to Prevent Strike in Kanawha

ACTION has been taken by the officials of United Mine Workers of District 17 (in the Kanawha field) to see that miners continue at work while a joint commission of operators and miners of the Kanawha, Coal River and Cabin Creek fields investigates and works out a scale for deadwork and tonnage rates and adjusts various inequalities now in existence, the text of the instructions being as follows:

"For your guidance find inclosed copy of agreement which will be in effect until the commission makes its report, which will be at the expiration of sixty days. At that time the book of rules will be re-edited and a convention called to act upon the agreement in full. The duties of the commission are to investigate differentials, inequalities and deadwork, in order to arrive at uniform rates for deadwork and tonnage.

"The above arrangements have been entered into so that the members of our organization may receive the advance handed down by the Bituminous Coal Commission until we can work out an agreement satisfactory to all parties concerned. Therefore, the policy is to keep the mines in operation while this revision is being made. We insist upon co-operation in this work by every local officer and individual member to the end that the commission may if possible be able to complete its work sooner than within sixty days from date.

"The Cabin Creek and Coal River operators will meet your scale committee on Monday, April 19. They ask for this continuance in order that they may be able to consult their associates regarding the demands that are being made by the miners. In the meantime they will be guided by the above arrangements. We earnestly request that the mines be kept in operation pending the action on April 19."

Governor Allen and Samuel Gompers to Debate on Industrial Relations Court

GOVERNOR HENRY J. ALLEN of Kansas has accepted a challenge for a public debate with Samuel Gompers, president of the American Federation of Labor, on the new Kansas Court of Industrial Relations.

In fathering the new court Governor Allen established the precedent that in a controversy between employers and employees the rights of the public are paramount to those of labor or capital. Employers in such essential industries as the transportation or production of fuel are forbidden to close down their business without the permission of the court, and workmen in such industries are forbidden to strike.

This provision of the law, which was a conspicious feature of the recent strike of Kansas coal miners, caused it to be attacked by Mr. Gompers. Cooper Union probably will be selected as the scene of the discussion, but the date has not been chosen.

Butler-and-Mercer District Accepts Wage Increase

NO difficulty was found in the Butler and Mercer County sub-district (No. 5) of Pennsylvania in arriving at a wage settlement. The mine workers received, of course, the full 27-per cent increase over the old contract, the new scale being signed on April 15. The scale, which affects eight thousand to ten thousand men in about sixty mines, is operative, like the other, for two years or until April 1, 1922. No changes were made in the working conditions.

Pick mining rates were increased from 93c. per ton to $1.17 per ton, cutting by punchers from 22½ to 28½c. per ton, cutting by chain-machines from 14 to 18c., loading after punching machine from 54 to 72c., day work from $5 to $6, from $4.84 to $5.84 and from $4.51 to $5.51, according to the grade of work. All yardage and deadwork was increased 20 per cent over former rates.

Railroad Conductors and Switchmen Seek Wage Increase

Arguments on wage increases demanded by conductors and switchmen were made before the U. S. Railroad Labor Board April 22 by L. E. Sheppard, president of the Order of Railway Conductors, and S. W. Heberling, president of the Switchmen's Union of North America. The demands of switchmen call for pay increases of approximately 58 per cent with time and a half for overtime, Sundays and holidays. Similar overtime allowances are asked by conductors, together with wages sufficient to enable them to live at the pre-war standard.

Labor Conditions in Canada Improve

Latest reports from the Canadian Department of Labor in Ottawa show considerable all-round improvement in labor conditions, although there was a slight increase in unemployment. During March there were twenty-two strikes, involving about 3,789 workers and resulting in a time loss of about 43,169 working days.

Mine Workers Attack Senator Harding's Labor Record

AT THE April 15 session of the twenty-second annual convention of the United Mine Workers of Sub-District 5 of Ohio, Senator Warren G. Harding of Ohio was attacked as a candidate for President in a resolution reported by the resolutions committee and adopted by the convention. The labor record of the Ohio Senator was denounced as "black" and miners were called upon to aid in defeating Senator Harding as a candidate for President.

William E. Green, secretary-treasurer of the international organization of the United Mine Workers, in an address predicted that the struggle over what he termed the "Stone" question would rival that incidental to the enactment of the mine-run law.

Thurmond Board Hears Complaints

THE first meeting of the joint board of coal operators and mine workers of the New River field, constituted under the recent wage agreement entered into by the operators and mine workers of District 29, U. M. W. of A., was held at Thurmond, W. Va., on Tuesday, April 13. Sessions were continued until Thursday morning, April 15, to hear and pass upon complaints and grievances in the relations between the employers and their employees. The joint board is the means provided under the wage contract for arbitrating differences arising between mine workers and operators.

At this session twelve complaints, none of them of a serious nature, were lodged with the joint board and evidence on them was taken. On the new joint board are: G. H. Caperton, chairman; S. A. Scott, of MacDonald; R. H. Morris, of Ansted, representing the operators; J. R. Gilmore and J. H. Sprouse, president and vice-president, respectively of District 29, and Joe Patton, a member of the executive board, representing the miners.

Car Supply in Kentucky Considered by Railroad Men and Operators

WITH a view of improving the car service situation in the Kentucky coal fields, W. C. Kendal, chairman of the Car Service Commission of the American Railway Association, presided over a meeting of railroad officials held in the office of John A. Morris, chairman of the local operating committee, in Cincinnati, April 19.

Those present at the meeting were C. E. Phelps, Louisville & Nashville, of Louisville; F. M. Lucore, Southern Pacific, Houston, Texas; W. R. Harris, Big Four; J. G. Brooks, Baltimore & Ohio; W. S. Andrews, Cincinnati; D. E. Stangler, Norfolk & Western; W. L. Booth, Chesapeake & Ohio; J. H. Doggrell, Frisco system; G. W. Briece, Missouri Pacific; E. J. Grace, Missouri, Kansas & Texas; G. W. Eskridge, Monon; George McVeagh, Big Four; R. E. Quirk, former chief examiner of the Interstate Commerce Commission; R. C. Buchanan, inspector of the Interstate Commerce Commission, and A. G. Gutheim, member at large of the car commission.

Those complaining about the car shortage were the Hazard Coal Operators' Association, Harlan County Coal Association, Southern Appalachian Coal Operators' Association and Western Kentucky Coal Operators' Association.

It was said after the meeting that as soon as the labor troubles that have existed among switchmen are at an end the loading capacity, now said to be about 55 per cent, would be increased to 75 per cent by the return of empty cars, many of which are said to be in the southern part of Ohio. Meetings such as this one are becoming regular current events. It is generally admitted that but little immediate improvement can be expected in the car supply in these fields for some time to come.

Lack of Demand for Coke Affects British Columbia Coal Production

THERE has been a marked falling off in the production of the Crow's Nest Pass coal field of British Columbia, due largely to decreased demand for coke. The ovens at Fernie are idle, those at Michel alone being active in this field. In 1918 coke production of Michel and Fernie was about 18,000 tons a month.

The explanation of the slackness of the coke market as far as the Crow's Nest is concerned lies in the closing down of the Canada Copper Corporation smelters at Greenwood, and the Granby Consolidated Mining & Smelting Co. smelter at Grand Forks. The latter company also is now in a position to produce byproduct coke from Vancouver Island coal at the new Anyox smelter. There may be other reasons behind the condition at Coal Creek and elsewhere in that district, where the men have been working little more than half time, but those given may be accepted as chiefly responsible.

On Vancouver Island the situation is different, although there was a period following the strong demand of the winter during which the trade fell off sufficiently to affect to some extent the operation of the mines. During February the Canadian Collieries, Ltd., kept their men at work at the three Comox mines for seventeen days, at Extension for twenty-two and one-half days, and at South Wellington for twenty-three days. The Canadian Western Fuel Co. operated its properties at Nanaimo, Harewood, Reserve and Wakesiah for twenty-four days in February. This also applies to the collieries of the Granby Consolidated Mining & Smelting Co. at Cassidys, the Pacific Coast Coal Mines, the Nanoose-Wellington Collieries, as well as the Coalmont Collieries in the Nicola-Princeton Field.

What the forthcoming season is going to bring to coal operators in the bunker business remains to be seen, but it is feared that exchange conditions are likely to have such an effect on the mercantile trade of the Pacific that the collieries of this province will find the market unpleasantly quiet. However, the output figures for the island collieries for the month of March indicate that the market has become brisker and that production has increased. This is particularly evidenced in the output of the Pacific Coast Coal Mines and it also is worthy of note that the production of the Cassidy Collieries, Granby Consolidated Mining & Smelting Co., likewise shows a substantial advance.

The British Columbia coal output for the month of February, 1920, was as follows: Crow's Nest Pass district, 67,053 tons; Nicola-Princeton district, 15,289 tons; Vancouver Island district, 137,255 tons; Prince Rupert district, 325 tons.

The returns for March are available only for Vancouver Island and show an increase, due to greater number of working days, from 137,255 net tons to 144,605 tons.

Car Manufacturers Meet to Discuss Industrial Problems

MOST successful and interesting proved the second annual meeting of the Industrial Car Manufacturers' Institute, which was held in Pittsburgh on April 20, 1920. The following were elected as the Board of Directors for the coming year: Lion Gardiner, vice-president, the Lakewood Engineering Co., chairman; N. A. Doyle, vice-president, American Car and Foundry Co.; W. E. Farrell, president, Easton Car & Construction Co.; J. M. Hansen, president, Standard Steel Car Co.; J. R. Kilbourne, vice-president and general manager, the Kilbourne & Jacobs Manufacturing Co.; R. J. Magor, president, Magor Car Corporation; J. C. Shirer, president, the Star Manufacturing Co. Col. James Milliken was re-elected president of the institute and H. M. Wey, secretary.

The institute is a get-together association of a number of the manufacturers of industrial cars, organized to procure economic results, promote a spirit of co-operation among its members, provide means for interchange of views affecting the interests of industrial car builders, to preserve equitable conditions not only in the workshop but in selling practices, to standardize designs and specifications, and to bring about a uniformity in methods of inspection, purchase, etc. In order to secure the best results the organization has been divided into four groups, according to the class of cars manufactured, namely: Builders of (1) coal-mine cars; (2) standard-gage dump cars; (3) other standard-gage cars, and (4) all narrow-gage cars except coal-mine cars.

After adjournment of the meeting the members were taken to the country home of Charles H. Clark, president of the Clark Car Co., in the South Hills of Pittsburgh. An excellent banquet was served, after which R. J. Magor, as toastmaster, introduced the following speakers: Lion Gardiner, A. L. Humphrey, president of the Westinghouse Air Brake Co.; W. F. M. Goss, president of the Railway Car Manufacturers' Association; C. E. Watts, efficiency engineer of the Berwind-White Coal Mining Co. and who represented the American Mining Congress; N. A. Doyle, and H. E. Chilcoat, general manager of the Clark Car Co.

A Crime to Burn Oil Under Boilers

NOT only is it a crime to burn oil under boilers, but also an unprofitable sin into the bargain, was the testimony of Capt. Douglas E. Dismukes, commanding the Naval Training Station at Newport, R. I., in giving testimony before the Committee on Naval Affairs of the House of Representatives considering the Naval Appropriation Bill. This statement was recently circulated by the Wholesale Coal Trade Association of New York.

It appears that the captain declared that "it is more economical to use coal" than oil. On inquiry he admitted he was using oil at the training station, but only because he had oil-burning plants as well as coal-burning plants and therefore could not avoid burning oil in the former.

Captain Dismukes reported a conversation with Dr. White, of the U. S. Geological Survey, in which that authority declared it "no less than an economic crime to use oil under boilers as fuel," because the supply of oil was so rapidly declining in the United States and elsewhere and because it would soon be "a very serious problem as to getting the necessary amount of lubricants—which is really the most important part of the rock-oil business."

"I understand," said the captain, "that the Mexican wells supply us with about eight million barrels a year, and the information that now reaches us is that salt water is getting into those wells and there is an indication of exhaustion." Unless it would cost too much to get back to coal he proposed that the plants be changed so as to burn coal. Mr. Padgett stated that coal was found to be much cheaper than oil on the Atlantic coast, but on the Pacific coast oil was much the cheaper. At that time the freight on coal to the Pacific coast was $6 a ton. He added that Pocahontas and Georges Creek coal cost delivered at the water's edge $2.10 and $2.20, but it cost from $5.20 to $7.50 to get it around to the Pacific.

Circuit Court Upholds Mining Company in Important Mine-Tax Case

JUDGE DENISON of the Circuit Court of Appeals for the 6th district, has just handed down an important decision in the case of the Mohawk Iron Mining Co., of Minnesota. This company claimed an allowance of $35,000 for depletion on account of ore taken out subsequent to March 1, 1913, but the Bureau of Internal Revenue declined to allow the deduction because the mining company was operating under a leasehold and not in fee. The lower court rendered judgment in favor of the mining company for the full amount of the taxes.

The company claimed it was entitled to the depletion allowance the same as a fee owner, because the law allowed the allowance to the "taxpayer" rather than to either the owner or the lessee; that it would be natural for Congress to intend that such allowance be made to the party actually suffering substantial depletion; that the lessor would have a depletion allowance which would wipe out the royalty and leave him no tax to pay.

The Court said that when the question of right of allowance arises as between fee owner and lessee it can make no difference whether the claimed allowance is called by one name or by the other. It holds that the provision regarding depletion in real substance and effect pertains to a consumption of capital assets rather than to a business loss.

Bethlehem Steel Co. Buys 7,000 Acres of Bituminous Coal Land

FOLLOWING a meeting of the Board of Directors of the Bethlehem Steel Co., April 22, E. G. Grace, president of the company, announced the purchase of the Jamison Coal & Coke Co., bituminous coal properties in West Virginia.

"The property we have acquired," Mr. Grace said, "is located only fifteen miles away from the property of the Elkins Coal & Coke Co., recently acquired by the Bethlehem interests. The property consists of about 7,000 acres of coal land, having proved up over 65,000 tons of a good quality of low sulphur gas coal. The property is in operation and equipped to produce 1,000,000 tons of coal annually. The Bethlehem Steel interests are now fully supplied with their full requirements of all kinds of bituminous coal."

Discussion by Readers

Edited by
James T. Beard

Itemizing Costs in Coal Mining

Letter No. 1—In the issue of *Coal Age*, March 4, p. 437, there appeared an itemized list of coal-mining costs prepared by the Oakdale Coal Co. of Denver, Colo., the purpose of which was, no doubt, to stagger the reader with the immensity of the expense under which the coal operator is laboring.

No one believes more in justice to all than myself, but this reference appears to be slightly overdrawn or, in other words, is extreme in its position with respect to the operator.

It is not my intention to question the items, in fact more could be added than what appears. All the costs or expenditures that an operating company has made or ever will make should be included in such a list. On second thought, however, should not the weight of each item, or its relation to the determination of the price of the product, which in this case is coal, have been made the main feature?

As the list now stands, it would lead the unwary observer to the immediate conclusion that the operator is a philanthropist, and is giving good money away instead of earning it for the investors. In how many instances, let me ask, is this statement of mining costs applicable? Not many, I fear.

Would it not be more to our benefit to have such a table prepared showing the ratio that each item bears to the whole sum. The present showing is a mere conglomeration and its publication effects little of any value in the more economical operation of a mine. It would lead to a clearer understanding of the economics of the situation, and relieve many false ideas in the minds of those outside of the fold if relative values of the items of cost were made to appear.

Golden, Colo. MINING ENGINEER.

Carbide Lamps in Pillar Robbing

Letter No. 1—Referring to the inquiry of "Mine Foreman," *Coal Age* Feb. 26, p. 419, kindly permit me to present a few considerations relative to conditions that if considered may assist this correspondent in the solution of his difficulty. First, I will mention one or two points regarding ventilation. They are as follows:

1. Owing to the disastrous and far-reaching effects of explosive gases, our mining laws require adequate ventilation to dilute and sweep away the gases and render them harmless and make the mine safe for work. Then, why not use the same precautions with respect to that treacherous atmosphere known to the miner as "blackdamp," which appears to be the direct cause of the trouble in the instance cited in this inquiry.

2. If the proportion of carbon dioxide in the mine air has increased to such an extent as to extinguish an oil light, there is no assurance that it will not continue to increase to an extent that will render the atmosphere dangerous and extinguish the *lamp of life*.

3. If it is possible to control conditions so as to keep the oxygen content of the mine air above the stated 14 per cent so that the oxygen in the air will range from that point to 18 per cent, why not make still further effort and maintain a percentage of oxygen ranging from 18 to 21 per cent, or normal.

In making these suggestions, I have in mind the eliminating of large areas of abandoned workings in proximity to pillar work. Where the conditions will warrant and such abandoned areas exist and generate much carbon dioxide that is constantly fed into the workings, every effort should be made to drain the gas from such areas.

In the blowing system of ventilation, danger lies in the possibility that any derangement of the ventilating current, relieving the pressure that holds the gases back in the abandoned places, will permit those gases to expand into the workings. The draining of these gases from abandoned areas will eliminate this possibility.

WORKING IN "TWILIGHT ZONE" DANGEROUS

4. It should be considered risky business for men to work in what we may call the "twilight-zone" or where the lights of the miners burn dim. The extinction of an oil lamp indicates a near approach to the life-line of the oxygen content of the mine air. Let us consider, then, that the failure of an oil lamp to burn is a sure indication of the *twilight zone* of uncertainty; and the possible increase of carbon dioxide may cause the twilight to fade into darkness and the atmosphere become unsafe.

5. Turning now to the workmen, let us consider how they are affected when compelled to breathe air where the lights burn dim. The manufacturer of a 150 horsepower steam engine does not expect it to give good results when supplied with steam that will generate but 50 or 100 horsepower. In like manner, nature having provided an atmosphere containing normally 21 per cent of oxygen, good results in the performance of work cannot be expected when the oxygen content is depleted to 15 per cent, or even to 18 per cent, as shown by the dim burning or extinction of an oil lamp.

But, the conditions here described involve more than an ordinary element of danger. We are apt to attribute it to lack of ventilation, rather than to the generation of carbon dioxide; and forget that the resulting depletion of the oxygen means a corresponding increase in nitrogen in the air, whereby the atmosphere is rendered more dangerous than if the presence of the carbon dioxide had not depleted the oxygen.

One theory in explanation of the condition described is that it may have been caused by an obstruction of the

ventilating current or an air-leak, either of which is liable to happen in mining practice, and that without warning. In any case, it is clear that the mine foreman in charge had not provided any safe margin to guard against such occurrences.

Another theory suggests a more likely and, incidentally, a more dangerous cause of this condition. It is stated that "the work of robbing pillars was proceeding in an abandoned section" of the mine. This assumes the possibility of the condition to which I referred previously; namely, the close proximity to large abandoned areas generating carbon dioxide, which will expand into the workings whenever there is a slight relief of pressure owing to a falling barometer or a possible derangement of the ventilating system.

In closing, I would only add to what the editor has said in his reply to this inquiry, that the warning given, by the carbide flame, of the presence of a dangerous atmosphere is only observable by experienced eyes. In my own practice, I have seen the carbide light show a reddish tint and an increased length of flame in perfectly pure air, which makes these appearances seem unreliable as an indication of bad air. We know that an oil lamp grows dim or goes out either from a lack of oil or from a lack of oxygen sufficient to support the flame, and it is an easy matter to find out which of these causes exists. I am not disputing the claim that the indications mentioned reveal the presence of bad air, I would emphasize the fact, however, that such indications are often misleading. It is my belief that the action of carbide lights, in bad air, can be summed up in a few words. As remarked by the editor, "They give a safe but frequently unobserved warning of the presence of danger to the men at work."

Portage, Pa. JEROME C. WHITE.

Factors in Mine Ventilation

Letter No. 1—I was much interested in the article by R. Z. Virgin, *Coal Age*, Feb. 26, p. 395, entitled "Considerations Influencing Mine Ventilation." Having been employed for the past 25 years in the coal mines of Pennsylvania and having served for 12 years of this time in an official capacity, I am inclined to think that the subject of ventilation is not generally given the consideration that it deserves, especially in the planning and laying out of large or gaseous mines.

Where a mine is opened with the intention of working out the coal from a considerable acreage it is necessary to make the main intake and return airways of sufficient size to enable the required volume of air to be circulated at a moderate velocity. If this is not done there will result a great waste of power in the ventilation of the workings. The circulation of a considerable volume of air through airways of small size, means a high velocity and a high pressure or water gage, which can only be maintained by a large expenditure of power.

Frequently, I have observed fans producing, say 100,000 cu. ft. of air per minute, against a water gage of 4 in. or more. At some points in the main airways the velocity of the current would reach 2,500 ft. per min., owing to the restricted area of the air-course and the lack of proper distribution of the air throughout the mine; or, in other words, the failure to provide separate ventilating districts.

In my opinion, a mine should be so planned that the air volume required for ventilation can be circulated in such a manner that the velocity will nowhere exceed, say 1,000 ft. per. min. The ventilating system should be so arranged that the water gage will not exceed two inches in the fan drift. A high velocity of the air current produces a big mine resistance, the latter increasing with the square of the former. For example, if the velocity of the air is twice what it should be, the mine resistance is four times too great; and the power required for the circulation is 8 times what would be required if the velocity was normal.

Another consideration is the fact that a high pressure or water gage increases the leakage of air through the stoppings, with the result that a smaller proportion of the air entering the mine reaches the working faces. This also causes a great waste of power in ventilation. The only way to reduce the resistance of the mine is to provide ample airways so that the required air volume can be circulated at a low velocity.

This is an excellent subject for discussion and will prove of benefit to those who are fitting themselves for a mine foremen's or assistant foremen's examination. I hope to learn the opinion of practical foremen in regard to what they consider the limit of the velocity of air currents in mines; also, the limiting water gage to obtain the best results. ERNEST KRAUSE,

Adah, Pa. Mine Superintendent.

Letter No. 2—Kindly permit me to refer to a seemingly misleading feature, in the article entitled "Considerations Influencing Mine Ventilation," which appeared in *Coal Age*, Feb. 26, p. 395. The article is written with the evident intention of proving the necessity of keeping all air passages and air-courses clear of obstructions, as far as it is practicable to avoid these. Attention is drawn particularly to the obstruction caused by cars standing in the airway and rockfalls in air-courses, which decrease the sectional area of the passageway or entry.

The writer of the article presents three illustrations, one showing a 6 x 10 ft. airway, clear of all obstructions; another, the same airway obstructed by a mine car; and the third, the same airway obstructed by a rockfall, which is assumed to cause the same reduction of area as that produced by the mine car.

CALCULATING THE INCREASE OF VENTILATING PRESSURE

For example, the unobstructed airway is shown to have a perimeter of $2(6 + 10) = 32$ ft., and a sectional area of $6 \times 10 = 60$ sq.ft. When this airway is obstructed by a mine car 4 ft. high and 5 ft. wide, it is explained that the cross-section of the car has an area of $4 \times 5 = 20$ sq.ft.; and the sectional area of the airway is thus reduced to $60 - 20 = 40$ sq.ft. The same reduction of area is assumed to be caused by a rockfall in the airway.

It is further explained that, not only is the sectional area reduced from 60 to 40 sq.ft., in each of these cases; but, the perimeter of the airway, which represents its rubbing surface is increased by the perimeter of the car, which is $2(4 + 5) = 18$ ft., making the total perimeter when the airway is thus obstructed, $32 + 18 = 50$ ft.

In the case of the rockfall, however, which rests on the bottom of the air-course, there is presented but

three sides to the air current, and its perimeter is $2 \times 4 + 5 = 13$ ft., which makes the total perimeter, in that case, $32 + 13 = 45$ ft. all of which can be accepted as logical reasoning.

However, the features to which I wish to draw attention as being misleading are the following: In order to show the effect of thus obstructing an airway, the author of the article applies the first law of friction, which makes the pressure producing a circulation, vary directly as the rubbing surface or the perimeter of the airway, "other things being equal." But, it is needless to say that, in the cases assumed, other things are not equal.

For example, not only does the perimeter change, but the sectional area of the passage also changes when the latter is obstructed in the manner described. Therefore, the author should have applied another rule of friction, which states that the pressure producing circulation in an airway varies inversely as the cube of the sectional area, for the same quantity of air passing, the length of the airway being assumed constant.

Expressed in other words, the pressure producing any given quantity of air in an airway, varies directly as the perimeter and inversely as the cube of the area of the airway; or, the pressure ratio is equal to the product of the perimeter ratio and the cube of the inverse area ratio. Thus, assuming a 2-in. water gage, giving a pressure of $2 \times 5.2 = 10.4$ lb. per sq.ft., since the original perimeter of 32 ft. was increased to 50 ft. and the original area of 60 sq.ft. was reduced to 40 sq.ft., and calling the pressure x, due to the obstruction,

$$\frac{x}{10.4} = \frac{50}{32}\left(\frac{60}{40}\right)^3 = \frac{25}{16}\left(\frac{3}{2}\right)^3$$

$$x = \frac{10.4 \times 25 \times 27}{16 \times 8} = 54.8 \text{ } lb.\ per\ sq.\ ft.$$

This would represent a water gage exceeding 10 in. Cars standing in an airway is a common form of obstruction, but no one ever heard of it resulting in such an increase of pressure. By omitting the effect of the reduction of area in his calculation, the author finds the pressure is increased only in the ratio of the perimeter, 50:32, making the increased pressure 16.25 lb. per sq.ft., or somewhat greater than a 3-in. water gage; but even that would be excessive.

My theory regarding an obstruction in an airway is that its effect is similar to that produced by a regulator that causes the same reduction of area. The pressure due to a regulator is calculated by the formula:

$$A = \frac{0.0004\ Q}{\sqrt{w.g.}}; \text{ and } p = 5.2\left(\frac{0.0004\ Q}{A}\right)^2$$

For the sake of comparison, I will assume the airway, 6 x 10 ft. in section, to be of such length that it will pass, say 30,000 cu.ft. of air per minute, under a 2-in. water gage. Then, assuming an obstruction in the airway that reduces its area to 40 sq.ft., and applying the formula for finding the increase of pressure due to this obstruction, treating it the same as a regulator, gives for the water gage due to the obstruction

$$w.g. = \left(\frac{0.0004 \times 30{,}000}{40}\right)^2 = 0.09 \text{ } in.$$

Practically, this is the increase of water gage due to an obstruction such as a car standing in an entry, which reduces the sectional area from 60 to 40 sq.ft., when the original unobstructed airway would pass 30,000 cubic ft. per minute under a 2-in. gage. The water gage would therefore be increased less than one-tenth of an inch.

JOHN WALLS, SR.

Bayview, Ala.

Health and Industry

Letter No. 3—I want to compliment John Rose for the expressions conveyed in his letter in *Coal Age*, Feb. 19, p. 364. The statement he quotes to the effect that solving the labor situation is wholly a question of religion, is a plain and truthful statement and shows the author to be a great and good man. We need more men of the same kind.

The more one observes conditions about the mines, and studies the labor situation, the more he is convinced that the principles of religion form a common platform on which not only nations, but employers and employees can meet and settle their difficulties. Faith in religion means trust in God, which is our national motto and will insure a like trust in one's fellows. Trust is mutual and invites trust in return. The man who fails to trust his fellow cannot be trusted himself; and such a condition makes possible the inroads of Bolshevism and other bad elements.

Trust and confidence must start with the higher officials of coal companies. Confidence in the men employed in the mine will, in time, develop a like confidence of the men in the goodwill and well meaning of their employers. Let us hope that this condition will increase and prevail and that the labor troubles of the past will rapidly disappear under its influence.

Connellsville, Pa. JOHN W. SWOPE.

Co-operation Among Mine Officials

Letter No. 8—The letters on the need of co-operation among mine officials should be read by all mine foremen, superintendents and managers. Many good ideas have been presented that are worthy of consideration, and the adoption of some of them will certainly prove worth while in building up and strengthening the organization.

One thought that I have in mind is that the relation between a mine foreman and his superior officer should be such that if an occasion arose in the mine that called for immediate and independent action on the part of the foreman, he would not be humiliated later by receiving a severe reproof.

HUMILIATING THE MINE FOREMAN

It goes without saying that a foreman called to act independently, as occasion may demand, will use his best judgment, though he may err, as results sometimes show. But, when a foreman is humiliated by receiving a severe reproof at such time, one of two things will surely happen if he is a true man. Either he will resign his place, or make up his mind then and there, that he will never again take the initiative.

Foremen should always be willing to submit all matters of importance to their superiors in office. An honest, well meaning foreman will do this, although it cannot be denied that an occasion will arise when he will be compelled to act on his own authority.

There are mines where a foreman seldom meets his superintendent, without being called to task for some

action, trivial though it may be; or asked to explain some increased item of expense on the cost-sheet. These are not auspicious times for making the best showing in the operation of a mine. On this account, it is all the more important that there should be perfect understanding between the officials in charge of the several departments of the work; and this will go far to avoid unpleasant relations between them.

For the success of mining operations, there should be a team-spirit in the organization, from the trapperboy to general manager. A selfish and distant attitude on the part of an official is sure to result, sooner or later, in a large labor turnover, petty strikes and lockouts.

Fair Treatment and Goodwill Accomplish More Than Force and Coercion

On the other hand, fair treatment of men will show in the increased production of coal, at a reduced cost per ton. The co-operation needed to effect this can only be secured through goodwill. Formerly, labor was loyal, because it was afraid to quit; but, today, conditions are different and unemployment has no terror for the workman. Labor can only be retained through the cultivation of interest and the expression of goodwill. But, it can be said with certainty that these will not fail to produce results.

Attention has been drawn to the fact that the day of force and coercion is past and the Golden Rule, suggested by John Rose when writing on another subject in *Coal Age,* must now take its place. Without exaggeration, it can be assumed that 90 per cent of men wish to deal fairly with each other; and it is not difficult to suppose that the remaining 10 per cent can be won by an appeal to reason.

Explain to a man who is wasting time and material, that he is throwing away what is not his own. Reason will cause him to understand that, in thus hindering the company who employs him, he is hindering himself. The man who loads slate with his coal, knows that his act will give the mine a bad reputation on the market, and lessen the chances of steady work.

Altoona, Ala. JOHN JONES.

Letter No. 9—It would seem that the need of co-operation was set forth so prominently in the recent discussion, in *Coal Age,* on the "Efficiency of Mine Officials," that further comment would be mere repetition. However, I want to emphasize the fact that co-operation, in its broadest sense, is not an abstract idea but a vital force without which little of real value is to be accomplished.

Reflection on the ideals and accomplishments, in life, causes one to realize that it is easy to speak glibly on co-operation; but a far more difficult matter to put our words into action. Co-operation is a lofty ideal. Its practice means the setting aside of our selfishness and working conjointly with another for a common purpose designed for the betterment of each.

As an ideal, co-operation appeals to us in every way; but its realization is kept at a safe distance, because of the natural selfishness of the human heart, the same now as throughout all time. Self-examination convinces us that we are each a mass of inconsistencies; our acts belie our words, until we are at variance with and strangers to ourselves.

Considering the question of co-operation in mining, from a practical standpoint, one is constrained to inquire as to what the term means and its application in practice. An honest study of industrial conditions makes clear that men of various ideals, temperament and education are brought into close touch with each other. They are associated in a common purpose, each with a selfish end in view; namely his own personal profit. Naturally, there is a conflict of individual interests which develops a restlessness on the part of each one involved in the transaction.

What Real Co-operation Means

Here, then, is the opportunity to co-operate. Will either party put this ideal into action? Will they apply the Golden Rule and each treat the other as he would be treated himself? That would mean a sacrifice of possible attainment. It would mean standing, for a moment, in the other man's shoes and getting his viewpoint and appreciating his needs, which would eventually determine a more equable division of individual rights.

Co-operation is simple. It means going along with another; working side by side in a common cause; drowning personal ambition and profit in feelings of goodwill, sympathy and help, one for another. How many of us can rid our minds of the evil disease that pervades our selfish natures? How many of us can center our efforts on a closer fellowship with our associates in the industries in which we are engaged? We all have the power to make life brighter for a fellowworker when simply a cheery word, timely spoken, will dispel discouragement and bring success out of failure.

Facing the Stern Realities of Life

Turning then to the practical side, we face the stern fact that all must work to live. Many have the false notion that they live to work, forgetting the old saying "All work and no play makes Jack a dull boy." Plainly, it is our duty, as individual workers, to contribute our part to the brightening of the lives of fellowworkers, by sharing with them the ups and downs, the successes and failures, common to all industries. Genuine co-operation means the taking of a deeper interest in the work in hand. Where such interest is compelled by regulative measures and forced circumstances, the work and life itself becomes a monotonous routine.

Let me say in closing, that nothing is more certain than the fact that, in whatever way we strive and however well we may succeed in securing our own profit, we can take nothing with us when we go hence. Therefore, the fact remains that there can be no profit whatever in our lives, apart from the enjoyment of fellowship and co-operation that will lift the burden from the shoulders of another.

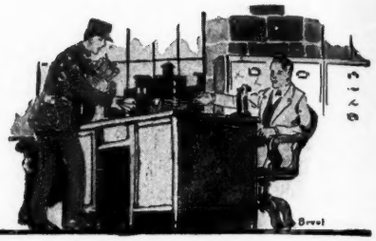
To reap the greatest benefit, co-operation must be genuine and prompted by a desire to be helpful. To this end, it is necessary to cultivate the simple faculty of human fellowship, which is possessed by all to a greater or less degree. In writing thus, it has been my desire to show that co-operation is not a passing fancy, but a real factor that is being practically considered by eminent men today, and is particularly applicable to coal-mining conditions.

Ladysmith, B. C., Canada. WILLIAM WESNEDGE.

Inquiries of General Interest

Answered by

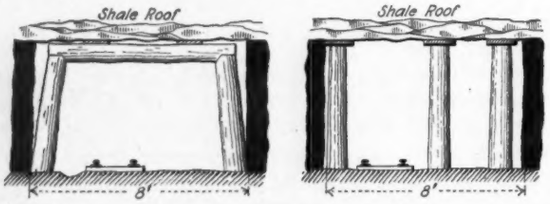
James T. Beard



Timber Booms or Crossbars

In going about the mines, it is common to see roads, travelingways, rooms and air-courses, having a good shale roof that is free from slips or other faults, where double timber is used, instead of posts. This consists of a boom or crossbar placed against the roof and supported by a prop at each end of the bar.

While such timbering gives a good roomy appearance to the entry, it always seems to me that the use of the boom is unnecessary when driving entries and rooms under a good shale roof. So often I have observed the boom bending under the weight of the strata above, or even broken. At other times, I have seen the ends of the booms crushed where it rests on the heads of the two posts. Often the boom has given away and the road is blocked with great falls, which cause much delay, until the road can be cleaned. I am wondering if a better method of timbering places that are eight or ten feet in width would not be to set posts along the roadside with good cap-pieces against the roof. Would there not be a saving if these crossbars were set as props in the manner I have indicated in the accompanying sketch,



which shows both the method of supporting the roof with a boom resting on two posts and the plan I suggest of posting the entry.

To my mind, timbering with posts gives a better support to the roof, in the place it is needed, than is possible with a boom spanning the entry. The labor of setting timber is much less than that required in double timbering. There is also provided a good traveling space between the rib and the posts at the side of the road. My idea is that this plan would give better support to the center of the entry. I am assuming, of course, that the ribs are good solid coal. Kindly explain what objection there is, if any, to this plan of posting an entry, 8 or 10 ft. wide, under a good shale roof.

Nova Scotia, Canada. MAC.

It frequently happens that an entry 8 or 10 ft. wide, under a good shale roof will require little timbering when the roof strata is of a nature that does not cut under the action of the air. There is always an objection to standing posts on a haulage road, owing to the danger of the posts being knocked out by a derailed car, or men being caught between a post and a passing car.

These dangers have often been referred to in *Coal Age*, and different methods explained for avoiding the standing of post timber on roads. One of these methods is to cut hitches in each rib a short distance below the roof, to enable the cross bar that spans the road to be slipped into the hitches. Another method is to support the crossbar on two short legs that rest in suitable hitches cut lower down in the rib.

In the opinion of *Coal Age*, where the roof above a road or entry requires support some form of double timbering is better than the posting described by this correspondent. A substantial form of post timbering is always advisable at the face of a room, but few will deny that double timbering is better on a roadway or entry where haulage is performed. It should be stated that a crossbar must never be wedged at its center. Instead, two wedges should be driven between the roof and the bar, a short distance from each end. This plan avoids throwing the weight of the sagging roof on the center of the bar; tending to arch the weight and throw the roof pressure on the supporting legs at the two ends of the bar.

Recharging Storage Batteries

Kindly inform me if the recharging of a storage battery on a mine locomotive will generate a gas that is ignitable, and if so, what is the cause and how can it be eliminated? Has there ever been an explosion occurring in a recharging room in a mine.

Canaanville, Ohio. H. CUNNINGHAM, Supt.

The recharging of a storage battery on a mine locomotive will generate hydrogen gas in sufficient quantity to prove dangerous under certain conditions. The quantity of gas generated will be greater if the recharging is carried too far, which is very liable to happen in mining practice by reason of the person in charge of the work neglecting to give it the careful attention required.

When the batteries are fully charged the current should be at once shut off, as otherwise overcharging will take place and hydrogen gas will be set free in larger quantity. In shaft mines operating storage-battery locomotives, the batteries must be recharged underground, and care must be taken in that case to prevent accident. The recharging of the batteries must be done in a well ventilated place where there can be no danger from a possible accumulation of gas. The attendant must not allow the batteries to become overcharged. In drift and slope mines the locomotives should be run to the surface and the batteries recharged in the open air, thereby avoiding all chance of trouble.

Where recharging of batteries is performed in a recharging room, the place must be thoroughly ventilated and no open lights permitted. We have no record of an explosion having occurred from this cause in a mine, but shall be glad to be informed if such has occurred.

Examination Questions

Answered by

James T. Beard

Mine Inspectors' Examination, Held at Pottsville, Pa., March 30, 31, 1920

(Selected Questions.)

Ques.—If the horsepower of an engine is 60 and the water gage 1.5 in., what quantity of air will you expect to get, assuming the horsepower of the engine is 70 per cent efficient?

Ans.—The efficiency of the engine being 70 per cent, the effective power on the air is $0.70(60 \times 33{,}000) = 1{,}386{,}000$ ft.-lb. per minute. A water gage of 1.5 in. corresponds to a pressure of $1.5 \times 5.2 = 7.8$ lb. per square foot. In this case, therefore, the quantity of air that should be passing under this pressure is

$$Q = \frac{u}{p} = \frac{1{,}386{,}000}{7.8} = 177{,}700 \text{ } cu.ft. \text{ } per \text{ } min.$$

Ques.—A slope is sunk, in a vein 6 ft. thick and pitching 30 deg., to the second lift. The east gangway is driven 1,000 ft. and the west gangway 2,000 ft. from the center of the slope, both on an ascending grade of 6 in. per 100 ft. Both gangways are 8 ft. wide at top, 12 ft. at bottom, and 7½ ft. high. There is a tunnel 12 ft. wide, 8 ft. high, on center line of slope, driven level to overlying veins in which there is a brick dam 150 ft. from top slate of slope vein. The slope is filled with water to a point 288 ft. on the pitch above foot of the slope. What is the total pressure on the face of the dam, and how much water is in the slope, assuming 45 per cent of the vein has been mined?

Ans.—It is difficult to understand the meaning of the statement at the close of this question; namely, "45 per cent of the vein has been mined." If this statement means that 45 per cent of the coal in each lift has been taken out, the distance between the lifts or the distance the coal is worked out above each gangway should be given. Even then, it could hardly be supposed that the space left by the extraction of the coal would remain open and be filled with water to the level indicated by the head of water in the slope. Though the question does not so state, it may be assumed that the two gangways and the tunnel mentioned start from the foot of the slope at the second lift. The width of the slope is not given.

It is a simple matter to calculate the cubic contents of the slope, assuming its width to be the same as that of the tunnel, and to make the same calculation for the tunnel and the two gangway levels at the second lift, taking the height of the tunnel as 8 ft. while the height of the slope is supposed to be the thickness of the vein, or 6 ft.

Since the distance of the dam is measured from the top slate of the slope vein, the roof line extended to intersect the floor of the slope would increase this distance 12 ft., since sin 30 deg. is 0.5, and $6 \div 0.5 = 12$. Again, the distance from this intersection to the foot of the slope is $8 \div 0.5 = 16$ ft. Then, since cos 30 deg. is 0.866, we have $\frac{1}{2}(16 \times 0.866) = 6.9$ ft.; and $150 + 12 - 6.9 = 155.1$ ft., which is the mean measurement of the water in the tunnel extended to its level in the slope.

Now, since the water rises in the slope to a distance of 288 ft., measured on the pitch from the foot of the slope, we have $288 - 16 = 272$ ft. of slope distance filled with water. The length of the two gangways, east and west, less the width of the slope is $1{,}000 + 2{,}000 - 12 = 2{,}988$ ft.

The sectional area of the tunnel is $8 \times 12 = 96$ sq.ft.; that of the slope, $6 \times 12 = 72$ sq.ft.; and that of the gangways $\frac{1}{2}(8 + 12)7\frac{1}{2} = 75$ sq.ft. The volume of water in these openings is, therefor,

Tunnel,	155×96	=	14,880
Slope,	272×72	=	19,584
Gangways,	$2{,}988 \times 75$	=	224,100
	Total		258,564

The head of water above the center of the dam is $0.5 \times 727 + \frac{1}{2}(8) = 140$ ft. The total pressure on the face of the dam, under this head, is $(140 \times 62.5 \times 96) \div 2{,}000 = 420$ tons.

Ques.—What is the total ventilating pressure required to pass 22,400 cu.ft. of air per minute through an 8 x 8 ft. airway 5,000 ft. long?

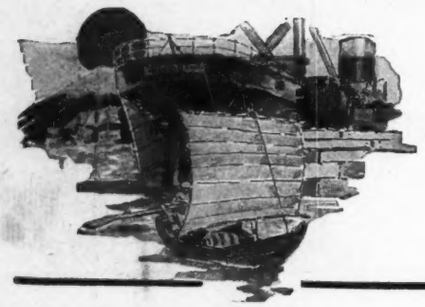
Ans.—The rubbing surface of this airway is $s = 2(8 + 8)5{,}000 = 160{,}000$ sq.ft. and its sectional area, $a = 8 \times 8 = 64$ sq.ft. The pressure required to pass the given quantity of air is, therefore,

$$p = \frac{k\,s\,q^2}{a^3} = \frac{0.00000002 \times 160{,}000 \times 22{,}400^2}{64^3} =$$

$6\frac{1}{8}$ *lb. per sq.ft.*

Ques.—Of two airways under the same pressure, one 6 ft. wide, 6 ft. high, 5,000 ft. long; the other 8 ft. wide, 4½ ft. high, 5,000 ft. long; which will pass the greater quantity of air and why?

Ans.—The sectional area of the first airway is $6 \times 6 = 36$ sq.ft.; and that of the second, $8 \times 4\frac{1}{2} = 36$ sq.ft. Since these airways have the same sectional area and are of the same length, the quantity of air each will pass, under the same pressure, will vary inversely as the square root of the perimeter. The perimeter of the first airway is $2(6 + 6) = 24$ ft.; and that of the second, $2(8 + 4\frac{1}{2}) = 25$ ft. The first airway having the shorter perimeter has a less amount of rubbing surface and offers less resistance to the passage of the air, on which account it will pass a larger quantity of air, under the same pressure, than the second airway, the ratio being $\sqrt{25}:\sqrt{24}$, or 5:4.9. In other words, when the first airway is passing 50,000 cu.ft. per minute, the second airway will pass only 49,000 cu.ft., under the same pressure.



Foreign Markets and Export News

Switzerland Will Rely Chiefly on United States for Coal

Since the time of the armistice, according to a report by the Secretary General of the Swiss Department of Economy, transmittted by Consul General Leo J. Kenna, Zurich, Switzerland has had to look out more and more for new sources of coal supply. Since the middle of 1919 England has helped out with certain quantities, but this amounted to less than 20,000 tons monthly. The United States, however, has made substantial shipments of coal and thus saved the country from a catastrophe. As, apparently, shipments from England during the coming months will be restricted, Switzerland is depending chiefly on the United States.

Swiss requirements of American coal in the near future will be about from 120,000 to 150,000 tons monthly, and authorities earnestly hope that the United States will be able to supply this quantity. A purchasing department has been added to the Swiss Legation at Washington by the Swiss Coal Association at Basel, which is charged with the purchase and shipping (securing freight space) of the coal.

The impossibility of obtaining the above-mentioned monthly quota from the United States would create a most difficult situation for the economic life of Switzerland, since the quantities expected from America can apparently not be supplied by European production.

It is already evident to what degree Switzerland is dependent upon shipments from the United States, as especially industry and the railways see their supplies steadily decreasing in consequence of the continuance of miners' strikes and the enforced limitation of exportation.

France Imports from Germany Coal Valued at 407,446,000 f.

Coal, coke and briquets composed the most important class of imports by France from Germany in 1919, the value of the imports of these commodities amounting to 407,446,000 francs, or 69 per cent of the total for all imports from Germany. In 1913 the value of the imports of coal, coke and briquets from Germany was 164,958,000 francs, or 15 per cent of the total imports from Germany.

While the value of the imports of coal has increased 147 per cent compared with 1913, the quantity has decreased from 6,071,307 metric tons in 1913 to 3,165,532 metric tons in 1919, a loss of 48 per cent.

Coal Shortage an Obstacle to Belgian Rehabilitation

One of the chief stumbling blocks in the way of Belgium's industrial rehabilitation, Vice Consul Charles W. Drew, Jr., Brussels, reports, is shortage of coal. This factor tends to limit production and increase living costs, and so lies at the root of the constant demand for higher wages by the laboring classes.

The shortage of coal has been so acute that many factories have been forced to close or operate on part time. This has necessitated an indefinite continuance of Government assistance to the unemployed.

Exports and Imports of Coal and Coke During February and the Eight Months Ending in February*

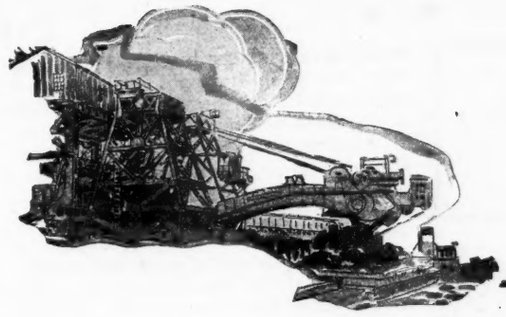
Coal and Coke Exported	February				Eight Months Ending February					
	1919		1920		1918		1919		1920	
	Tons	Value	Tons	Value	Tons	Value	Tons	Value	Tons	Value
Coal—										
Anthracite	216,018	$1,595,795	272,368	$2,388,712	3,300,105	$19,928,317	3,009,624	$20,484,427	3,160,955	$26,925,086
Bituminous[1]	683,708	3,126,985	1,168,806	6,384,095	13,948,930	54,574,371	13,178,265	53,841,575	13,511,072	66,324,297
Exported to—										
Italy	4,933	32,500	81,739	531,953	196,731	779,927	16,236	104,367	1,614,705	10,017,224
Netherlands	15,076	103,519	49,634	324,801	.....	.....	70,030	460,880	725,553	4,226,205
Sweden	.....	.....	8,886	60,547	.....	.....	.....	.....	170,858	1,060,228
Switzerland	.....	.....	17,123	109,806	.....	.....	.....	.....	470,543	2,647,460
Canada	446,429	1,638,250	541,270	2,286,818	11,145,039	40,857,575	10,824,721	39,525,668	7,079,880	26,810,980
Panama	8,661	40,697	30,692	185,676	417,605	1,584,503	248,382	1,087,337	97,682	586,951
Mexico	5,142	29,184	11,263	72,128	101,091	559,832	100,947	475,249	71,307	390,947
British West Indies	13,756	86,517	17,906	113,695	95,857	446,716	85,299	531,871	151,728	861,105
Cuba	40,644	262,319	130,846	856,511	864,488	4,312,168	732,249	4,620,623	786,992	4,925,890
Other West Indies	3,209	24,378	13,579	85,755	79,225	385,605	55,188	363,387	53,466	358,256
Argentina	38,993	240,101	70,902	469,739	154,336	803,901	133,911	818,983	516,300	3,349,473
Brazil	67,825	421,953	47,241	305,005	399,772	2,237,591	392,121	2,530,267	264,909	1,664,400
Chile	18,814	118,884	18,353	138,119	202,094	1,051,924	180,008	1,189,310	44,498	309,894
Uruguay	12,007	76,621	.....	.....	44,438	241,539	247,173	1,528,916	85,913	550,149
Other countries	8,220	52,062	129,372	843,542	248,254	1,313,090	92,000	604,717	1,376,738	8,475,135
Coke	48,806	377,758	59,866	518,432	767,171	5,620,780	884,669	7,130,162	473,235	3,770,759

[1] Does not include fuel or bunker coal laden on vessels engaged in the foreign trade, which aggregated during the month and eight months ending February, as follows: February, 1919, 417,841 tons valued at $2,954,104; 1920, 512,886 tons, valued at $3,570,370: eight months ending February, 1918, 4,103,855 tons, valued at $20,298,597; 1919, 3,879,568 tons, valued at $23,006,949; 1920, 5,184,011 tons, valued at $34,524,091.

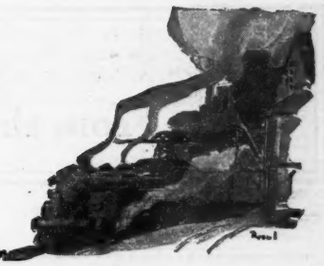
COAL AND COKE IMPORTS FOR FEBRUARY AND EIGHT MONTHS ENDING FEBRUARY

Coal and Coke Imported	February				Eight Months Ending February					
	1919		1920		1918		1919		1920	
	Tons	Value	Tons	Value	Tons	Value	Tons	Value	Tons	Value
Coal—										
Anthracite	4,250	$31,342	1,027	$8,989	10,692	$40,922	43,885	$283,768	52,644	$368,607
Bituminous	55,834	331,914	87,890	489,666	927,345	3,855,850	758,367	4,126,335	728,004	3,986,289
Imported from—										
United Kingdom	.....	.....	200	800	19,198	157,542	2,186	10,490	6,496	75,178
Canada	55,834	331,914	85,852	481,000	898,103	3,655,857	741,776	3,996,922	666,740	3,624,172
Japan	.....	.....	.....	.....	7,889	32,372	12,714	112,435	6,312	72,588
Australia	.....	.....	731	3,159	1,413	5,157	1,369	4,869	46,202	197,810
Other countries	.....	.....	1,107	4,707	742	4,922	322	1,619	2,254	16,541
Coke	1,258	12,469	1,982	20,679	18,174	132,588	15,205	138,730	12,251	119,741

* Compiled by Bureau of Foreign and Domestic Commerce.



Production and the Market



Weekly Review

Railroad Strike Continues to Affect Coal Production—Situation Desperate in Some Sections of the East—Early Improvement Will Still Leave a Large Deficit That Will Keep the Market Strong the Remainder of the Summer—Prospects for Coal to Meet Lake Program Very Poor.

WORSE conditions than during the strike last November now confront the bituminous coal trade. At that time the country was well stocked and there were millions of tons of coal on the rails, a supply that lasted for many weeks even with the cold weather. Today, in the grip of the outlaw railroad strike, without reserve supplies, consumers are helpless and producers are able to assist them but little.

Because the railroads are unable to move the empties back to the mines or the loads from the coal fields except to a very limited extent, many mines are idle and the remainder are working irregularly. East of Chicago industrial plants are forced to work part time, and in some instances, to close entirely.

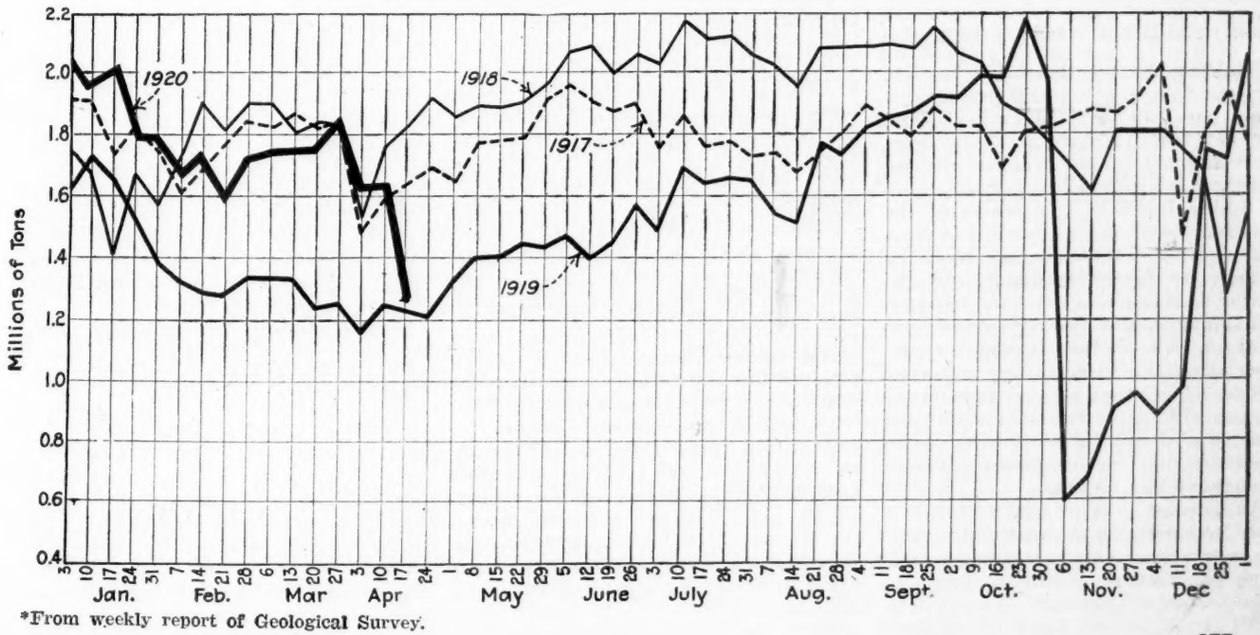
Among the plants which have been obliged to shut down owing to lack of coal are those of Cluett, Peabody and Co., at Troy, N. Y., the Eastern Malleable Iron Co., at New Britain, Conn., and at some other points, the Hunt-Spiller Co. at Boston, the Chevrolet Motor Co. at Tarrytown, N. Y., and the MacEwen Bros. paper mill at Whippany, N. J. There are many companies both in New England and in New York who are finding it impossible to run because of the lack of coal. MacEwen Bros. had twenty-five of their cars confiscated in one week, the railroads taking high-grade low-sulphur coal and using it for engine fuel. The Pennsylvania R.R. is reported to be confiscating coal quite indiscriminately, having no regard to its character or suitability for locomotive use.

In the East the situation in the coal fields is particularly acute—for example, the Monongahela Ry. has five-thousand loaded cars on its line which have been standing for nine days, and practically no empties have been put in at the mines. The authorities at Pittsburgh demand permits for the shipment of cars, but when inquiry is made for permits at the headquarters of the railroads they respond by saying that none is required.

From Brownsville, Pa., to Fairmont, W. Va., the mines as an aggregate, received only thirty-five cars last Friday, and the operators were allowed to consign these only west. The Pennsylvania R.R. is moving cars which were weighed before the strike, but is unwilling to take care of any coal which was loaded since that time. The Baltimore & Ohio is running about 40 per cent., but no coal is allowed to go off its lines. In consequence a large amount of coal is moving to Curtis Bay, the shippers not having opportunity to deliver it elsewhere.

It is needless to say anything about prices because nobody has any coal to sell. It is true that some coal has been sold from storage, but the volume of sale is so small that no reliable inferences can be drawn from the price for which it is sold.

Average Daily Production of Bituminous Coal*



*From weekly report of Geological Survey.

Reports From the Market Centers

New England

BOSTON

Market Firm—Spot Prices Soaring—Traffic Troubles Unravelling Slowly—Few New York Piers in Operation—Hampton Roads Despatch about Normal, but Light Dumpings for New England—Distributors Inland Have Little Coal Available and Command High Prices — Anthracite Domestic Sizes Coming Forward Slowly—Steam Sizes Quiet.

Bituminous—The market here shows great strength. Buyers find it extremely difficult to arrange purchases with reliable shippers, for the reason that labor and other conditions at the mines are so unsettled. Most operators have sold a large proportion of current output, and some steam-users are in desperate straits to secure spot coal. Most manufacturers have so many orders for their goods that they do not quibble about price and spot coal sales are made at higher and higher prices—the better grades at figures well in excess of $5 per net ton.

New York piers being out of commission, because of yardmen's and longshoremen's strikes, has led to an extra volume available for destinations all-rail; some shippers selling at quite remunerative prices, others confining themselves to making better deliveries on contract. When the tidewater piers reopen it is probable there will be quite light shipments all-rail for a considerable period.

Bunker and Export Trade Is Attractive

Bunker and export trade is attractive for low volatiles, high-grade Pennsylvania coal being quoted here at $5.50 per net ton, but this does not seem representative. The trend is upward, and there is likely to be a further swing to higher levels in the course of the next fortnight.

The New York Central embargo against the Boston & Albany and the Boston & Maine was lifted on April 16, and shipments are moving toward New England. The railroads are quite short, especially the New Haven, and consignees expect that a heavy percentage of coal will be confiscated for railroad use. Car-supply is improving quite gradually, but motive power is short throughout this territory.

An attempt to move coal by the rail route occasions tie-ups and embargoes. Reserves cannot be piled up under anything like present conditions. Traffic is in an extremely bad way. The switchmen's strike did not break out in New England but the results of the strike elsewhere were acutely felt here in the non-arrival of all kinds of freight, including coal.

Only two of the New York piers have been in operation the past fortnight. Enough pier space has been available for bunkering important steamers, and most of the railroads have embargoed coal for these piers. The Philadelphia piers resumed loading on April 19. In view of all this there has been a tendency here among coal factors to send to Philadelphia, barges that ordinarily would load at the New York piers. This has been particularly true of gas coal.

At the Virginia terminals—Norfolk and Newport News—steamers are now receiving customary despatch. To piece out cargoes some high prices have been paid for spot delivery, $9 having been reported for high grade Pocahontas. Heavy tonnages are being loaded for overseas and for Government requirements, but loadings for New England are much restricted. Practically no spot coal is heard of here in the open market. What Pocahontas and New River comes forward is moving in customary channels, but undeniably there is less coming to this section on contract than was the case in 1919, a year of extremely low tonnages.

High prices continue to be charged for prompt coal at the various rehandling points for shipment inland; $11 on cars Providence and $12 at Portsmouth and Portland are again reported. This level is justified by the heavy demurrage charges that accrued at the loading ports a fortnight ago.

Current quotations on bituminous at wholesale range about as follows:

F. o. b. mines, net tons—Clearfields, $4.00@4.75; Cambrias and Somersets, $4.35@5.15. F.o.b. Philadelphia, gross tons—Clearfields, $6.35@7.18; Cambrias and Somersets, $6.72@7.62. F.o.b New York, gross tons—Clearfields, $6.70@7.55; Cambrias and Somersets, $7.10@8.00.

Pocahontas and New River are quoted at $4 per net ton f.o.b. mines for contract, and up to $6 per net ton for spot coal. This would mean $6.54@8.66 f.o.b. vessel.

Anthracite—There is increasing uneasiness over the extreme slowness with which domestic sizes are coming forward. Embargoes are still the rule on most of the all-rail routes and the tie-up of the New York piers has accentuated the serious outlook for the coming season. A strike among marine workers is said to be brewing for May 1, and that with an anthracite strike would bring the movement of hard coal to a standstill.

Prices on stove and chestnut are soaring, due to the reported tactics of some operators. As high as $10.25 has been heard of for spot coal. Grand Jury proceedings have been instituted in the Federal Court here with a view to investigating the recent advance of $1 per net ton in the retail price in Boston.

Steam sizes are remarkably quiet. The same embargoes that prevent the shipment of domestic sizes are applicable against the buckwheats also, but industrially there is not the anxiety for bituminous substitutes that was the case a few weeks ago before the cold weather had gone.

Tidewater

NEW YORK

Anthracite Situation in Bad Shape—Rail Strike Delays Shipments—Poor Car Supply Hinders Production—Conferences Over Miners' Wages Continue—Local Trade Needs Coal—Bituminous Shipments Slow—Few Cars to Load and Mines Idle—Railroads Take Coal—Export and Bunker Demands Heavy.

Anthracite—Continuance of the outlaw railroad strike and the practical suspension of shipments to tidewater have caused a serious shortage of coal here. The local market is practically without activity. Receipts at the loading piers have been far below normal and actual needs, but there have been no serious complaints from consumers because of the stocks in storage previous to the railroad difficulties.

Trade Is Impatient

The trade is becoming impatient at the delay of the operators' and mineworkers' representatives in deciding upon a new working agreement. So far no inkling has come from the conference as to what action the operators will take on the demands of the miners. As the new agreement will be retroactive as of April 1, shippers are postponing billing their sales until the new prices are announced.

Conditions at the mines are not favorable to heavy shipments. The workers are restless because of the long conferences and the car supply is bad. Union leaders have consented to a continuance of work but the men look upon the prolonged discussions as unnecessary and already have shown signs of jumping the traces.

Current quotations for company coal per gross ton at the mine and f.o.b., tidewater at the lower ports are as follows:

	Mine	Tidewater
Broken	$5.95	$7.80
Egg	6.35	8.20
Stove	6.60	8.45
Chestnut	6.70	8.55
Pea	5.30	7.05
Buckwheat	$3.40@$3.75	$5.15@$5.50
Rice	2.75@ 3.25	4.50@ 5.00
Barley	2.25@ 2.50	4.00@ 4.25
Boiler fuel	2.50	4.25

Quotations for domestic coals at the upper ports are generally 5c. higher on account of the difference in freight rates.

Most of the coal now being produced is going to the West and New England, where supplies are low and consumers are anxious to fill their bins for next winter. The smaller sizes are in constant demand here with supplies way down. Owing to curtailed mining, most of these coals are being used in the boiler rooms at the mines.

Bituminous — Non-arrival of coal during the past week has caused many manufacturing plants to be on the verge of stopping operations. Tidewater receipts have been low, the railroads confiscating most of the coal on its way to this market. Contract coal does not move as easily as a week back.

Spot trading was almost unknown last week. There was no coal available and shippers who were fortunate enough to get some dumped saw that their contracts were taken care of.

Many of the harbor boatmen are still at odds with their employers, while those who are willing to work ask from 50c to $1 per ton towing charge. There are nearly 100 boats anchored near the loading piers waiting for coal.

The miners are exhibiting considerable uneasiness because of the poor car supply. Nearly 50 per cent of the mines were said to be idle on April 23 through the failure of the railroads to provide cars. The Pennsylvania R.R. has issued instructions that cars for fuel coal only be placed at some mines.

Confiscation of coal by the railroads continues, resulting in considerable trouble to the consignor who must endeavor to secure other fuel for his customer. Payment for coal so taken by the railroads is slow, but the trade expects that it will be at the full price at which the coal was billed originally.

Demand for coal for export is active. Freight rates have advanced in the neighborhood of $2 per ton, but shipments are said to be strong. Considerable more bunker coal could be used here were it available. The West is reported as receiving a large proportion of the present production. Heavy tonnages are also going into New England via all rail. Good gas coal is in heavy demand, but operators are so tied up with unfilled orders that they refuse to give quotations. Shippers have for the most part let contract holders know what additional cost they will be expected to pay for their coal because of the 27-per cent increase granted the mine workers. Where the contract provides for the change, the manufacturers will pay the increase.

Quotations for immediate delivery were hard to get here during the week ended April 24. Good coals were quoted from $3.75 to $4.50 f.o.b. mines, while loaded boats were held at from $10 to $12. No questions were asked concerning the quality or grade. Car supply on the Pennsylvania, Baltimore & Ohio and Western Maryland lines was about 50 per cent, while on the New York Central it was about 60 per cent.

Quotations for coal at the mines ranged from $4.50 to $4.75 for Shawmut; $4.75 for Buffalo, Rochester & Pittsburgh grades; while along the New York Central lines Pool Nos. 10 and 11 were being held at around $5, and Pool No. 18 around $4.50. Central Pennsylvania coals were being quoted around $4.50.

PHILADELPHIA

Anthracite Dealers Flooded with Coal—Embargo on Foreign Roads the Cause—Not Expected to Last Long—Dealers Stock to the Limit—Consumers Anxious for Delivery—Stove and Nut in Chief Demand, but Strong Call for Egg and Pea—Growing Trade in Buckwheat—Steam Sizes All Taken—Bituminous Does Not Improve—Light Tonnage Comes In—Spot Coal Runs from $5 to $5.70 at Mines—Light Contract Deliveries.

Anthracite—The unexpected has happened in the anthracite retail trade—the dealers have more coal than they know what to do with. This unusual condition is accounted for by reason of the connecting lines refusing to take any freight from the anthracite roads. To move their product, the smaller shippers solicited orders from retailers along the line; this was not difficult until the big companies began to make consignments, regardless of orders, to their regular customers, then the dealers had to cry quits. Many of the dealers ran up heavy car demurrage bills rather than miss the chance of storing a heavy tonnage at this time. But there was difficulty in securing the necessary labor to unload the coal and the consignees had to have shipments held up.

Delivery equipment has been kept active and it will not be long before the stocks in the yards again vanish. All see that the time is not far off when the deliveries from the mines will be extremely small—just the moment that the foreign lines are open for consignments. Due to the embargo against the city proper, the outside points at first received much heavier shipments, but later many cars that had been refused along the line were diverted to local dealers.

Fortunately the weather for the first time this season is quite summery, there is but little demand for current consumption and the dealers are enabled to put their full energy into filling the summer orders.

The question of price concerns all. The big companies still ship at the April figures, but subject to whatever wage arrangement is made with the miners. One independent is said to be pricing coal at $9.25 at mines for egg, stove and nut, and retailers are making a retail price based approximately upon this figure. Others are making deliveries to the trade well known to them, with the understanding that bills are to be rendered later, after the wage matter is concluded.

The great preference of the consumer continues to be for stove and nut, although pea coal is being called for in an amount almost unheard of at this time of the year. Usually pea is not heavily stored, but the consumers are taking advantage of the opportunity to get as much of this size in as possible, thinking there will be little pea coal to be had after a short time. Egg coal is also being called for in heavy quantity, as the adoption of hot-air furnaces in the last few years has greatly increased the demand for this size.

There is an increasing demand for buckwheat coal from the domestic trade, and the gradual increase from year to year indicates that in a short time most dealers will be carrying this size for house heaters, particularly if pea coal is eliminated as a domestic size.

There is a good supply of buckwheat coming into the market, principally to manufacturers, and they are taking full advantage of the situation to stock to the limit, as they realize that the company price of $3.75 at the mines will not long remain in effect. The same can also be said about rice and barley, especially since the companies have as yet been unable to resume shipment from the storage yards, due to lack of empties for loading.

Bituminous—The bituminous situation is discouraging, to say the least, as quite a limited tonnage is coming in. The demand from all quarters is strong, which is borne out by the fact that numerous industries are closed down for the lack of fuel. The iron trade has been particularly affected, there being an almost complete dearth of gas coal.

The spot market price for Fairmont and Westmoreland is about on a level, ranging from $5.25 to $5.70 for the 3-in. lump, with mine-run from $5 to $5.20—these prices f.o.b. mines. In the steam coals those produced in Pennsylvania are selling on the market from $5 to $5.50, and with little to be had at such figures.

There is quite a little feeling shown by the concerns having contracts, at the very limited quantity of coal received, even under present conditions. The fact that coal can be had on the spot market at fancy prices annoys them. In addition, often when coal is consigned it is confiscated by the railroads for engine fuel.

BALTIMORE

Expected Relief Fails to Materialize—Bituminous Mines Closing Down—Spot Prices High—Contracts Delayed—Exports Continue Heavy—Anthracite Situation, a Waiting Game.

Bituminous—Coal men and consumers hoped that there would be a fairly quick recovery as to car movement, following the end of the railroad strike, but it failed to materialize. Starting the week with a little more than 50 per cent car supply on the Baltimore & Ohio, of around 70 per cent on the Western Maryland, and the Pennsylvania reporting a fair run, the supply on all lines has dwindled until it is now not much more than around 30 to 35 per cent.

A number of mines in the Georges

Creek and Upper Potomac regions report closing down as a result of lack of cars, the same with the Somerset and Fairmont sections. Coal men here are forced to use considerable discretion in distribution in order to prevent real trouble at local plants.

The usual stocking-up time is now entered with no immediate chance of using it to advantage. Meanwhile spot prices remain high. The good to best coals on immediate sale are now bringing (in this territory) around $5 to $5.50 f.o.b. mines.

Grades are not counting as the consumers are merely seeking coal to tide over an emergency. Contracting is still delayed by many coal firms. Others are entering contracts all the way from $3.75 to $4.50 f.o.b. mines.

The export movement goes on briskly. For the first half of the month the cargo loading here for foreign account ran close to 150,000 tons, and the month's total for export coal loading may run to close 400,000 tons.

Anthracite—The hard-coal situation here has resolved itself largely into a waiting game. Of deliveries of coal for immediate use the sales are being made strictly on existing schedule since last October.

For storage for future burning, the trade is merely taking orders on the basis of pay at the schedule to be set for the time of delivery. Some few dealers have accepted payment in advance at around 50c. a ton above present schedule from old customers, but the majority look for nothing less than a dollar advance over the present wholesale schedule.

Lake

BUFFALO

Coal Coming in Better, But Uncertain—Much Goes to Canada—Miners Not All at Work Yet—Anthracite Demand and Loading to the Lakes.

Bituminous—Improvement is so slow that the trade is wondering what will overtake it next. It will be some weeks before the movement is regular. The shortage in Canada has not been as severe at any time as it was here; at the worst only a few concerns had to shut down.

The shortage is as yet mostly on account of the failure of a good many miners to go back to work, claiming they are waiting for wage adjustment. The Allegheny Valley men are working much more generally than those further south, quite a good many in the Pittsburgh district still being idle. And now comes the Lake opening, which will draw much coal away from the rail route through this market.

The ice off this harbor gave way sooner than was expected, so that vessels go through it freely; boats are now going out light to load coal at Ohio ports. Business generally starts up slowly, mostly on account of there being no accumulation of coal at the Lake ports to load. The need of fuel on the upper Lakes will hurry it forward.

Bituminous prices are still unsteady, but not much is heard of big charges as was the case when the Government prices were thrown off. The trade will need to act with caution, for if the efforts of the railroads to increase the car supply succeed then it will weaken the market at once. Quotations must yet be regarded as mostly nominal at $5.75@$6 for Allegheny Valley mine-run (no other size made), $6.25@$6.50 for Pittsburgh and No. 8 lump and three-quarter, $6.25 for mine-run and $6 for slack, with some Youghiogheny gas at $6.75, all per net ton f.o.b. Buffalo.

Anthracite—Only good about the situation is that somehow the supply did not give out during the switchmen's strike. Anthracite was in better supply on track than bituminous when the strike ended. The demand is now mostly for next winter's use, in the hope of setting it before the prices go up.

The Lake coal trade is bound to be slow for awhile. Only one company has any coal to load into vessels; other companies have no notice of shipments for Lake loading yet. Summer shipments in the Lake trade will need to be heavy to insure a full winter's supply. It will take a big summer movement to satisfy the upper Lake trade.

CLEVELAND

Many Local Plants Working on Part Time—Months Before Return to Normal—No. 8 Coal Advances—Anthracite and Pocahontas Unchanged—Lake Trade Outlook Worst in Years.

Bituminous—Though coal roads into Cleveland—the Baltimore & Ohio and Wheeling & Lake Erie—still are the hardest hit by the railroad strike, receipts are increasing daily. Many of the local plants are on part time or have closed certain departments. That this condition will continue indefinitely is greatly feared. Even with strikers returning daily, conditions are little improved, and it will take months for the railroads to get back to normal. Comparatively little stocking will be possible this spring and early summer, and operators look for prices to stiffen up considerably. It is hoped that the government will intervene and thus cause the prices to become more uniform, which will help the trade in general.

A good-sized block of No. 8 slack has been closed at $3.75 f.o.b. mines, an advance of 50c. over the point where more conservative operators hoped to hold contracts. For spot No. 8 slack and mine-run retail dealers are forced to pay $4.25@$4.50 f.o.b. mines, against $4 recently The entire bituminous outlook is for higher prices, with steam-coal users seeking probably 50 per cent more than will be available all summer long. Some No. 8 mines have not operated for two weeks. The average for the district is not over 15 per cent.

Anthracite and Pocahontas—Prices on both grades have been unchanged. Demand has increased slightly, the railroad strike impressing upon domestic consumers the need for early buying. The expected advance in anthracite prices has not yet materialized.

Lake Season to Open Soon

Although the first bituminous coal cargo of the season has been taken to Lake Michigan ports, the first coal of the season probably will not get to the head of the Lakes before May 1. So acute is the shortage of fuel at upper Lake ports that tugs can scarcely be bunkered. What little coal is moving to Lake Erie ports is being confiscated by the railroads. Not in years have the prospects of the Lake trade been so poor, and a 20,000,000-ton season appears more probable than a 30,000,000-ton one.

Prices of leading grades of coal, per net ton delivered in Cleveland, by dealers follow: Anthracite—Egg and grate, $12.20 @ $12.40; chestnut, $12.50 @ $12.70; and stove, $12.50. Pocahontas—Shoveled lump, $10.50, and mine-run, $9.25. Domestic bituminous—West Virginia splint, $8.75; No. 8 Pittsburgh, $7.75; Millfield lump, $8.50, and cannel lump, $11. Steam coal—No. 6 and No. 8 slack, $7.75; No. 6 and No. 8 mine-run, $7.75; and No. 8 ¾-in. lump, $8.

MILWAUKEE

First Coal Cargoes of Season Arrive—Weather Milder—Coal Situation Relieved — Coke Scarce — Prices Unchanged.

The arrival of two cargoes of coal—one of 9,000 tons of anthracite and the other of about 7,000 tons of soft coal—together with a spell of milder weather, relieved the Milwaukee coal market of some of its tenseness, and from now on the situation promises to grow constantly easier.

Dealers had been unable to secure either coal or coke to supply an urgent demand, and steamers which were ready to sail could not secure bunker coal. Pea coke was the only fuel available before the new cargoes arrived. A strike of coal handlers complicated the situation at the yards, but unloading operations were not entirely blocked. The rail supply was held down to a minimum by the railway tie-up. Prices continue unchanged.

Continued cold weather keeps the Milwaukee coal market in quite an unsatisfactory condition. Supplies of all kinds are scarce and dealers are unable to keep pace with their orders. Some consumers have been compelled to resort to wood for their furnaces.

A cargo of 9,000 tons of anthracite, which arrived since last week's report, remains in the hold of the steamer because of a strike of coal handlers. The cargo was due last December, but the steamer was forced to winter in the

Straits of Mackinac. Some coal is coming by rail, but this supply is spasmodic and uncertain on account of the railway strike.

No Changes in Price

The following price list is maintained at all Milwaukee yards and docks. These prices represent the cost to the consumer in the wagon at the curb, or at points where coal can be dumped into chutes. When coal has to be carried into the bins an extra charge of 75c. per ton is made. An extra charge of 25c. per ton is also made in the case of less than ton orders. Coke is delivered in bags, hence there is no charge for carrying in.

Anthracite:	
Chestnut	$12.70
Stove	12.60
Egg	12.40
Pea	11.70
Buckwheat	9.75
Bituminous:	
West Virginia splint screened	8.50
Hi-Heat	8.50
Hocking screened	8.25
Pittsburgh screened	8.25
Pocahontas mine-run	9.25
Pocahontas screened	11.50
Cheerful chunks	10.00
Smithing	9.25
Cannel	12.50
Steam Coal:	
Youghiogheny screened	7.50
Youghiogheny pile run	7.25
Youghiogheny screenings	6.25
Pittsburgh screened	7.25
Pittsburgh pile run	7.00
Pittsburgh screenings	6.00
Hocking screened	7.25
Hocking pile run	7.00
Hocking screenings	6.00
West Virginia splent screened	7.50
West Virginia pile run	7.25
West Virginia screenings	6.25
Kentucky screened	8.25
Kentucky pile run	8.00
Kentucky screenings	6.25
Pocahontas mine run	8.25
Pocahontas screened	11.50
Pocahontas screenings	7.25
Smithing	8.25
Kanawha gas	Sold up
Bunker Coal (steamers and tugs):	
Pittsburgh lump	6.75
Pittsburgh pile run	6.50
Youghiogheny lump	7.00
Youghiogheny pile run	6.75
Coke:	
Large sizes	13.25
Small sizes	10.75

Inland West

COLUMBUS

Outlaw Railroad Strike Cripples Traffic —Reduces Coal Output to Low Point— Railroad Fuel 60 Per Cent—Factories Closing Down—Reserve Stocks Exhausted—Demand Strong and Prices Firm.

With the switchmen's strike still on, little coal is being produced in the Buckeye State. Some cars are being furnished and moved to users located on the originating lines. Demand for all grades is strong and prices are firm.

Railroad Traffic Still Crippled

While the strike of switchmen appears to be slowly disintegrating, still enough of the workers are out to seriously cripple railroad traffic in almost all sections. This is affecting the coal trade to a large extent and has reduced production to a low point. Empties are slow in being returned and loaded cars are held on side tracks awaiting movement to destination.

The longer the strike continues the worse conditions are, with railroads hopelessly congested at various points. The encouraging indication is that strikers will soon return to work to await action on the part of the new Wage Board.

While the railroads are not using as much fuel as customary, still a considerable tonnage is required to take care of passenger traffic. It is estimated that out of the total production in Ohio, railroad fuel is fully 60 per cent.

Factories are closing down in every locality and industry is seriously affected on all sides. This applies more particularly to northern Ohio and to Michigan industrial centers. In central Ohio industry has not suffered to any great extent.

The price question is still unsettled, and until costs are thoroughly gone over and prices in the open market are adjusted, little contracting is anticipated, either for commercial tonnage or Lake shipment. Steam users, whose contracts expired around April 1, are buying on the market and most railroads are doing the same. Some Lake tonnage is being loaded but prices have not been settled, and the loading is usually for permanent connections or for docks controlled by the producing company. Lake shippers are anxious for tonnage agreements.

Domestic trade is active, although stocks are light and dealers are now delivering only small orders so as to take care of all customers. Practically all reserve stocks are exhausted and dealers are operating from hand to mouth. Some few cars are being received which relieves the situation. Much coal is in Columbus, but can not be switched to dealers' yards because of the strike.

Retail prices are firm at the levels which have prevailed for several weeks. Hocking lump is firm at $7.50 and mine-run at $7.25, delivered; Pomeroy lump and mine-run are quoted about the same. West Virginia splints sell at $8.50 for lump and $8.25 for mine-run, while Pocahontas, which is quite scarce, retails at $10 to $10.50.

Prices for coals sold in Ohio, f. o. b. mines, are:

Hocking lump, $3.75; Hocking mine-run, $3.50; Hocking screenings, $3.25; Pomeroy lump, $4; Pomeroy mine-run, $3.75; Pomeroy screenings, $3.50; West Virginia splints, lump, $4.50; West Virginia splints, mine-run, $4.25; West Virginia splints, screenings, $4; Pocahontas lump, $6; Pocahontas mine-run, $5.50; Pocahontas egg, $5.25.

CINCINNATI

Little Coal Coming in from Points South—Lack of Cars—Car Distribution in Kentucky Fields—Cincinnati Receives Coal by Water—Brisk Coal Demand.

Conditions in the Cincinnati district continue abnormal. The rail strike is mainly responsible for this, aggravating, as it does, the shortage of cars at this gateway.

The transportation of coal seems to be the "thorn on the rose" as regards the rail strike in this section. Except for coal, it is reported that nothing approaching real inconvenience is being experienced in the Cincinnati terminals because of the strike.

Practically no coal is coming in over the Norfolk & Western and the Chesapeake & Ohio railroads, while it is reported that the Louisville & Nashville is confiscating coal for railroad use, although there is some coal being brought to Cincinnati by that road. Some of the industries up the state are reported to be in desperate need of coal.

The chief trouble at the mines is the lack of cars. This condition, the operators have been assured, will be relieved at least to the extent of 20 per cent, once the congestion caused by the switchmen's strike is lifted.

The railroads operating through the Kentucky fields, have not been receiving an equal number of empty cars in return for the loaded cars they turn over to connecting lines through the Cincinnati gateway.

In many instances where a road was found to have more cars on its tracks than its quota, that line was directed to forward a certain number of empties to one or another of the "south bank" roads, which are said to be short about 40 per cent of their original number of coal cars.

The Ohio River again has stood by the Queen City district in the time of need. While the river has risen in the Cincinnati district to a flood stage, the high-water has not been so pronounced in the upper valley, and consequently Cincinnati has been able to get its full share of coal from the West Virginia fields.

Never before in the history of the city have so many domestic users placed coal in their cellars so early in the season as they are doing at this time. The demand for all kinds of domestic as well as fuel for industrial purposes continues brisk, with many dealers unable to keep up with the demand.

ST. LOUIS

Mild Weather Eases Demand—Coal Hauled from Mines by Truck—Country West of River Suffers—Little More Than Railroad Fuel Mined.

The local situation, while it is trying, is much easier on account of the mild weather, for there is little domestic call. There were about 400 or 500 cars of coal in St. Louis when the strike started and this is gradually being delivered, as the few crews at work get cars unloaded.

The bulk of the coal for St. Louis and East St. Louis is, however, brought over from nearby Illinois mines in trucks at a hauling expense of $1.75 to $2.50 per ton.

Coal at East St. Louis is selling f.o.b. track for about $2.50@$3, for screenings, $3@$3.50 for mine-run and $3.75 @$4.50 for lump. This is Standard and Mt. Olive grades. Carterville coal, such as can be brought into East St. Louis for delivery, is worth $4@$4.50 a ton at the mine. A few mines on

the Mobile & Ohio and Illinois Central have been working about 1½ days during the week, ended April 24, loading chiefly railroad coal, which has moved south. A little domestic coal has been loaded for movement north to points where coal could go without passing through the terminals. The country west of the river is suffering for coal, especially steam and municipal plants; however, the railroads are relieving the situation somewhat. The Alton & Southern line at East St. Louis (connected with all the trunk lines) is open and delivering coal to the Missouri Pacific, at Dupo, which operates the ferry to St. Louis. The Missouri Pacific is thus enabled to deliver to connecting lines at St. Louis on railroad emergency coal only.

The railroad tonnage is sufficiently good to keep the roads fairly well supplied. Mines in the Mt. Olive field are practically idle, excepting on railroad coal one or two days a week. In the Carterville field the mines are working the same length of time on railroad coal and domestic tonnage that moves to points without going through terminals.

No mine prices are quoted, inasmuch as the tonnage is sold up for a month or two after the mines resume operations.

DETROIT

Bituminous Coal Supplies Diminishing—No Hope of Early Relief—Power and Light Companies Greatly Curtail Service—Anthracite Stocks Small—Weather More Springlike—Little Coal Movement on Lakes.

Bituminous—With only a small amount of coal arriving while the supply at hand is steadily diminishing, the situation in the Detroit market continues quite unsatisfactory both for dealers and consumers. Neither the railroads nor officials of the Detroit Edison Co. are able to give any hope for early relief.

The railroads, with the assistance of volunteer switching crews, recruited from the ranks of idle factory workers, are attempting to handle cars on the local terminal tracks; they are making a special effort to move coal in various railroad yards, to points where it will be accessible to the Detroit Edison Co. and the Detroit City Gas Co. While the amount thus made available is not great, it has enabled the Edison company to restore power service to its customers to the extent of 40 per cent of their normal requirements.

Leaders among the striking switchmen agreed that anyone desiring to do so might return to work but none of the strikers took advantage of this privilege.

Anthracite—Supplies of anthracite in the yards of retail dealers are quite small, and with almost no receipts the situation would be full of hardship for many household consumers were it not that temperatures are more springlike. Some of the dealers are reported as placing orders for anthracite, without knowing at what price shipments will be charged to them.

Lake Trade—Because of the strike on the railroads and the urgent demand for coal at lower Lake markets, there has been little coal sent to the Lakes for shipment to the northwest. In fact, the movement of coal from the mines is so light that few of the freighters have been able to get fuel for their opening trip.

South

LOUISVILLE

Better Car Supply Before Conditions Improve—Big Demand for All Grades —Prices Advancing Steadily—No Market—Operators Still Filling Contracts —Reduction in Rate to Ohio River.

Car shortage is resulting in average of less than two days at mines in this section, while prices are showing steady advance on better grades and by-product coal.

No betterment of the general situation is possible without an improvement in the coal car supply, and although numerous efforts are being made to secure relief, they have not increased the car supply as yet. The Commission on Car Service on March 20 issued orders for connecting lines to deliver daily to the Louisville & Nashville R.R. 245 more cars than were shipped; but the orders were not obeyed, and during the first week of the order it is reported the Louisville & Nashville was due 4,619 cars under this order.

Demand is in Excess of Supply

Demand for all grades of coal continues far in excess of supply, and car shortage is the dominating factor in curtailing production. Contracts should be coming in, but under existing price conditions, the consumer will not contract, nor will the operator accept contracts.

Many operators in the Kentucky fields predicted that upon the return of the railroads to private ownership car supply would improve, but this has not proved to be the case. Equipment has been badly scattered, the strikes have made it impossible to get it back promptly to owning roads, carriers are not co-operating with one another and sufficient new cars and locomotives have not been built to offset the number worn out and discarded. Such equipment as remains is in poor condition, with the result that no real improvement is looked forward to. Embargoes at present are checking a movement of empties back to the mines and loaded cars can only move into certain sections.

There is no such thing as a market today, as operators are still filling contract orders, which are taking practically all of the present small production, and any small surplus stocks mined are in such demand as to sell at fancy prices. It is reported that mines in the eastern Kentucky fields are getting over $6 a ton in many instances for run-of-mine.

BIRMINGHAM

Good Local Market—Railroads About to Close Yearly Contracts—Car Supply and Output Improve Somewhat.

There is a good steady demand for coal in this market, inquiry for steam being confined for the most part to spot business, contracting by steam users not having reached any material proportions as yet. The two railroads —Louisville & Nashville and Frisco Lines—which sent out specifications of requirements for bids, prior to April 1, have not yet closed contracts for the current year, but are expected to do so quite shortly.

Fuel requirements now being taken are subject to price adjustment when agreements are executed as of April 1. Quotations are reported to have averaged 50c. per ton above Government prices for the respective grades. Contracting for domestic coal has begun and considerable tonnage has been sold to dealers in this territory.

Few Price Changes Noted

Prices for steam and domestic sizes for April have not changed materially from quotations of a week ago. The movement of both grades is somewhat better with a slight improvement in car supply, efforts to speed up production and delivery to consumers now receiving the close attention of operators and distributors.

The output for the week ended April 10 (latest figures available) show a production of 323,152 net tons, an increase of about 45,000 tons over the previous week. Labor is somewhat short and not disposed to work full time, but working conditions otherwise are satisfactory.

West

SAN FRANCISCO

Rail Strike Hardly Affects Coast—Steamers Coaled as Usual.

The railroad strike has not affected the coal trade materially on the coast, although shipments from Utah and Wyoming have been suspended for awhile. With the strikers apparently losing out, normal conditions will be restored shortly, according to all indications.

No hardship has been worked on the big fleet of steamships calling at this port for coal for their bunkers, as the King Coal Co. has an immense reserve stock. Steamships have been coming here from the Orient and from Atlantic ports for fuel just as in the days before the strike and have been furnished all the coal wanted.

The bituminous prices, f.o.b. mines, wholesale, Utah and Wyoming, per net ton, are as follows: Stove, $4.00; lump, $4.00. The bunker price is $13.55.

News From the Coal Fields

Anthracite

WILKES-BARRE

Outlaw Strike Affects Anthracite Output—Many Northern-Field Mines Shut Down—Situation Elsewhere.

Railroad difficulties were rather disturbing to the anthracite companies during the week ended April 17. The outlaw railroad strike had quite a bad effect on the production of coal, the Wyoming Valley in particular. The Delaware, Lackawanna & Western R.R. ceased moving any freight as all of the switchmen and a large part of the firemen went out on strike. This meant that the coal department of the same company had to cease operations entirely, throwing out of employment about 20,000 men. Not only has the freight handling been disrupted but the passenger service has been hurt to a large extent.

Next to the Lackawanna the Erie R.R. has been the most affected, and for the greater part of the week no freight was handled. This meant that the Pennsylvania and the Hillside coal companies were forced to shut down, throwing 15,000 more men out of work. A total of 35,000 men were idle in the anthracite fields, and at the present writing there seems to be no probability of improvement in the near future.

Owing to the outlaw strike on the Central R.R. of N. J., the Lehigh & Wilkes-Barre Coal Co. has had to cease operations at all but two of its operations. No estimate has been made as to the number of men idle at the plants of this company.

PITTSBURGH

Shipping Conditions Improved Only Slightly—Monongahela River Proves Useful—Contract Negotiations Continue—Shipments Forwarded Without Price Attached.

While transportation conditions, in connection with the rail strike, have improved greatly at so many points, the betterment, as affecting the movement of coal from the Pittsburgh district, has been quite slight. The Conway yard of the Pennsylvania R.R. remains virtually out of commission, the Pittsburgh & Lake Erie is moving little freight outside of perishables and foodstuffs, and the Baltimore & Ohio is doing but little better.

One or two devious routes to seaboard have been discovered. A little movement is possible to Youngstown from some steam-coal mines of the Pittsburgh district, but nothing from any gas-coal mines, and nearly all the steel works of the Youngstown district are closed tightly.

CONNELLSVILLE

Coke Accumulating at Ovens—Fair Coke Movement by Water — Market Nominal and Prices Unchanged.

Practically the only business done in Connellsville coke since the rail strike tied up most of the movement more than a fortnight ago has been between parties separated by the rail strike from those with whom they usually do business. In such cases the business was done at practically the prompt market, or $11@12 for furnace grade.

Northern Appalachian

Columbus—Columbus city officials are considering the proposition of purchasing a 200,000-ton pile of slack, stored at New Straitsville, for use by the various city departments, including the water works and the municipal light plant. Officials have visited the pile and have taken samples for analysis. In case the purchase is made, the supply will last approximately five years. Officials claim it will work quite a saving in the fuel bills of the city.

Columbus—Bituminous coal mines in Ohio are nearly all closed because of the railroad strike and thousands of coal miners have been forced out of work. A few mines in scattered districts have been reported as still working, but all of the big mines have been closed, as the inability of operators to secure cars makes mining almost impossible. Public utilities all over the state are appealing for coal, and most of them have declared that unless an immediate supply of fuel is forthcoming many of them will be forced to suspend.

Columbus—The annual stockholders' meeting of the Sunday Creek Coal Co. was held April 7 at the offices of the company, when the former board of directors and officers were re-elected. The year, which dates from May 1, 1919, when the company was organized under the present name, was generally satisfactory, although there were a number of bad conditions in the coal trade to face. The board of directors consists of John S. Jones, H. B. Arnold, John H Winder, C. C. Cook and George K. Smith John S. Jones is chairman of the board; H. B. Arnold, president; George K. Smith, secretary, and C. C. Cook, treasurer. No vice-president was named to fill the vacancy caused by the resignation of I. A. Coen. O. S. Newton has been named general manager of the physical properties. J. R. Fitzer continues as sales manager and is given wider authority.

Cambridge—A record is reported in the production of coal in the Guernsey County fields for an eight-hour shift recently at the Forsythe mine, when two loaders mined and loaded 58½ tons of coal. The men were paid 80c. a ton and their aggregate earnings amounted to $4,680, or $2,340 each.

Cambridge—Of about 3,000 foreign-born miners in the Cambridge coal mining district of Ohio, practically every one has taken steps to become an American citizen. That is the statement of William C. Thompson, president of the sub-district United Mine

ESTIMATED UNITED STATES PRODUCTION OF BITUMINOUS COAL (IN NET TONS)

	Total bituminous, including coal coked			
	1920		1919a	
	Week	Calendar year to date	Week	Calendar year to date
April 3b	9,715,000	140,467,000	6,984 000	111,186,000
Daily average	1,619,000	1,749,000	1,164,000	1,385,000
April 10b	9.652,000	150,119,000	7.544,000	118,730,000
Daily average	1,609,000	1,740,000	1,257,000	1,376,000
April 17c	7,668,000	157,787,000	7,411,000	126,141,000
Daily average	1,278,000	1,709,000	1,235,000	1,367,000

a Less one day's production during New Year's week to equalize number of days covered for the two years. *b* Revised from last report. *c* Subject to revision.

ESTIMATED UNITED STATES PRODUCTION OF ANTHRACITE (IN NET TONS)

	1920		1919	
	Week	Calendar year to date	Week	Calendar year to date
April 3	1,278,000	27,570,000	1,044,000	18,571,000
April 10a	1,488,000	23,058,000	1,792, 000	20,363,000
April 17b	1,280,000	24,338,000	1,603.000	21,966, 000

a Revised from last report. *b* Subject to revision.

ESTIMATED PRODUCTION OF BEEHIVE COKE (IN NET TONS)

	Week ended				
	April 17. 1920b	April 10. 1920	April 19, 1919	1920 to date	1919 to datea
United States total	244,000	477,000	295,000	6,671,000	6,849,000

(a) Less one day's production during New Year's week to equalize number of days covered for the two years.
(b) Subject to revision.

Workers' organization, to show the Americanization work which is now going forward. He reports that before tne world war at least 65 per cent of the miners in the district were not American citizens and many had been residents of the country for 20 years or more. With the coming of war, union officials realized that those conditions could not continue and an amendment was made to the constitution of the state organization requiring all members to be citizens of America or at least declare their intentions of doing so. The result was little less than startling. Americanization classes sprang up in every locality, and American miners, who worked by the side of Hungarian, Slav and Pole workers, begun to teach them the English language. Principles of the American Government were also taught to the foreigners. Union officials were at the head of the Americanization work and many taught classes in the evenings. Union officials are quite proud of the record in the Cambridge district.

FAIRMONT

Complete Stagnation in Northern Fields —Mines Shut Off from Outside World —Assigned Car Practice Revived.

Complete stagnation of coal production in the Fairmont region and in certain other northern West Virginia regions during the week ended April 17, followed in the wake of the switchmen's strike. Cars were plentiful in the Fairmont and adjacent districts on Monday and coal still moved despite the strike on a number of roads; mines in northern West Virginia continued to mine and ship coal.

However, one outlet for northern West Virginia coal was cut off, when the Monongahela R.R. declared an embargo on all shipments north of Brownsville, Pa. By Tuesday 2,000 car loads of coal and coke had accumulated in the Brownsville yards and by Friday there were 2,600 loaded cars in those yards awaiting movement.

While embargoes debarring northern West Virginia coal from all tidewater piers had been imposed on Monday, there was still some coal moving eastward from this section during the first of the week. On Tuesday, however, switchmen and yardmen at the Keyser, W. Va., and Cumberland, Md., yards of the Baltimore & Ohio joined the strikers, when eastern movement of coal ceased.

Western movement was also affected to some extent even by Tuesday, through a walk-out of switchmen at Benwood, but there still remained an outlet through Holloway to the Lakes. By Thursday, the fifteenth, there was almost complete paralysis of mining operations in the Fairmont and other northern West Virginia mining regions, the outlaw strikes having shut off northern West Virginia mines from the outside world. Few if any mines were actually in operation.

Taking advantage of the assigned-car decision of the Interstate Commerce Commission, under the plea of an emergency, it became apparent that the Baltimore & Ohio and other roads in northern West Virginia were bent upon working the old system for all it was worth, not only to secure an immediate supply but a future one also. During the week ended the seventeenth, most of the fuel loaded was that at mines under contract to furnish railroad fuel, and it was reliably reported that the Baltimore & Ohio was trying to induce operators to accept $3.00 a ton in order to secure a better car supply and an immediate market for fuel during the strike. It was predicted that if the fuel thus secured by the railroad during the strike were stored, it would be a contributing factor in a car shortage.

Middle Appalachian

CHARLESTON

Western Markets Closed to Mines Here —Coal Goes to Tide—Many Mines Idle —Much Coal Under Contract

Mining operations in this section were quite perceptibly affected by the "outlaw" strike of switchmen, owing to the marked curtailment of the car supply which followed in the wake of the strike, the supply of equipment from the West being totally suspended during the greater part of the week ended April 17. While mines in this area were able to secure cars from eastern sources this supply was insufficient to take care of the increased territory from which the usual number of cars had been cut off. The shortage of equipment grew more marked as the week progressed and by the end of the period mines were securing only about a 25 per cent quota of empties.

Conditions Still Bad on K. & M. R. R.

Conditions were even worse as to mines on the Kanawha & Michigan R.R. Cut off from the western sources of supply, mines in West Virginia on the road named were forced to get along with five or six cars a day. Of course all movement of coal to the westward was cut off from the very beginning of the week, both as to the Chesapeake & Ohio and the Kanawha & Michigan, there being an embargo on all shipments west of Russell, Ky. When strike trouble broke out at Russell on the thirteenth, that only aggravated matters.

With western outlets closed, all coal from eastern Kentucky and from West Virginia mines reached by the Chesapeake & Ohio was being shipped to tidewater, and at the end of the week there was grave danger of an embargo even on tidewater shipments, owing to the fact that coal was pouring in on tidewater points faster than it could be dumped. As a result of conditions created by the strike of switchmen much idleness at the mines ensued.

The strike, insofar as it affected conditions in this part of the state, came at a most inopportune time because it was impossible to begin deliveries of coal to Lake ports. The week ended the seventeenth was supposed to have marked the opening of the Lake season but comparatively little coal was moved from this part of the state to the Lakes.

A large proportion of the 1920 coal year output of the mines in this section has been placed under contract, the bigger companies assuming the lead. Exports were holding up well and were naturally somewhat stimulated by the heavy eastern movement of coal.

Production was steadily on the downgrade in the Kanawha region, during the week ended the seventeenth, as a result of the switchmen's strike and its tie-up of western connections. As showing just how seriously the output was affected in the Kanawha, Cabin Creek and Coal River fields, production dropped from 26,650 tons for the Kanawha field and 13,250 tons for the Coal River field on Monday, to about 10,000 tons for the Kanawha field on Friday and only 5,000 tons for the Coal River field. Taking the week as a whole it is believed that the output was not more than 30 per cent of normal All Kanawha coal during the week was shipped to eastern markets, principally to tidewater, western markets being entirely closed to the Kanawha producers.

The New River field had, during the week ended the seventeenth, just two days in which the run of cars was at all adequate, so that there was much idleness at the mines in this field. Aside from Monday and one other day there was not more than a 30 per cent run of cars for the entire New River field, all because of the strike of switchmen. No coal whatsoever was shipped to western centers during the week, the entire output of the field moving to tidewater.

The most serious effect of the strike however, was largely to cut off the shipment of coke, since the greater part of the output of the New River ovens is sold in western markets. Export shipments continued on the up-grade during the week. Also it was estimated by operators that fully 60 or 70 per cent of the year's output of the New River region was under contract by the fifteenth.

BLUEFIELD

Embargo on Western Shipments—Big Surplus of Coal at Tide—Relief Soon or Shut-down of Mines.

A survey of the situation existing at mines dependent upon the Norfolk & Western R.R. for transportation facilities, reflected quite a serious condition of affairs, for which the "outlaw" strike was largely responsible. As early as April 10 the strike had necessitated an embargo on all western shipments, so that by the thirteenth absolutely no equipment was coming through the western gateway for use at Norfolk & Western mines. Hence mines were dependent upon eastern sources for a supply of empties.

There was just about half as many cars available as there had been during previous weeks, with the result that

most mines were not able to work more than one or two full days out of the six. No coal whatsoever went to western markets, all fuel being diverted to eastern points — principally to tidewater.

The outlaw strike seriously interfered with the car supply in the Winding Gulf field during the week ended the seventeenth. No coal was moving west from that field, the entire output being shipped to tide, a part of it over the Chesapeake & Ohio. According to reports there were 600,000 tons more coal at tidewater piers than there were vessels chartered, leading operators to believe that there would soon be an embargo on everything to Hampton Roads unless the situation was relieved in the West. Of course, in such a contingency, it would mean practically a shut-down of all mines in the Gulf district.

Pocahontas Production Slumped

Pocahontas production slumped quite appreciably during the week ended April 17 as the result of strike conditions, the output being not more than from 40 to 50 per cent, principally because of the difficulty in securing cars. As all coal was moving to the East, it was hard to return empties with as much celerity as is usually the case.

It was possible during the previous week to use cars from the western gateway and cars coming out of shops in the Thacker field; the cars from the East went to the Pocahontas and Tug River fields; but as soon as such temporary relief was exhausted, the car supply dwindled quite perceptibly.

The heavy demand to tide resulted in an embargo, at least as to certain pools, about April 19. Coal coked during the week amounted to 12,632 tons. Cars furnished were equal to only about 40 per cent of requirements.

Tug River operators and railroad officials expressed the opinion, early in the week beginning the nineteenth, that there would be little coal loaded after the middle of that week. Western gateways, from the Tug River field, were entirely closed during the week ended the seventeenth both as to shipment of loads and the supply of empties.

HUNTINGTON

Guyan Output at Low Mark—Big Logan Decrease—Cars Scarce—Western and Northern Gateways Closed.

At no time in recent months has production in the Guyan field been at a lower ebb than was the case during the week ended April 17, that being one of the effects of the strike which seriously curtailed the car supply. The shortage of cars was due to the fact that no empties to speak of were received from the West at all during the week, all equipment coming from eastern points.

No Improvement in Car Shortage

As a result of such transportation conditions, the output for the entire week was little more than 150,000 tons, with car-shortage losses aggregating about 225,000 tons. As all western markets were cut off, the entire output of the field was shipped to tidewater. The demand was sufficient to absorb the greatly increased tidewater tonnage, but the sudden concentration of the entire output of southern West Virginia fields resulted on the nineteenth in an embargo on high-volatile coals at Newport News.

With Western and Northern gateways closed, there was no coal shipped to the Lakes, although the season was to have been opened and Logan operators had made arrangements to ship quite a considerable tonnage to such ports. Prices were still buoyant. As far as could be learned, much additional tonnage, covering the year's output, had been put under contract.

The switchmen's strike affected production on the Chesapeake & Ohio system to the extent of 100,050 tons. Whereas there had been a movement of 11,037 cars of coal over the Chesapeake & Ohio during the week ending the tenth, the equivalent of 551,850 tons, there were only 8,996 cars of coal handled during the following week, representing 449,800 tons, so that there was a decrease of 2,041 cars, or 102,050 tons. There was a decrease of 12,650 tons in the Logan field alone.

Morgantown—Announcement was recently made that the eighth annual short course in coal mining at the West Virginia University will open on June 21, and continue until July 31. This course gives mining men an opportunity to thoroughly prepare for the examination for mine foreman and fireboss certificates which will be held later by the State Department of Mines. There were but four men enrolled in this course in 1917, 23 in 1918, and last year there were 57 men in attendance. It is expected that at least 125 will attend the short course this summer. A report just received from Raleigh County indicates that there will be more than 25 men from that county alone. An announcement of this course is being mailed to all postmasters of coal mining towns, as well as to the officials of all the coal companies in the state. This poster gives full information of the various classes and subjects. Additional copies of this poster can be obtained from Prof. A. C. Callon, Morgantown, who will be in charge of the course.

Ivanton, W. Va.—Ivy Branch Coal Co., Ivanton, W. Va., is preparing to increase production of Block coal, by laying an additional siding, installing shaker screens and constructing a number of new miners' houses. The company expects to have a daily production of not less than 500 to 600 tons before June 1. Leo F. Moore is superintendent.

Southern Appalachian

Birmingham — The Sloss-Sheffield Steel & Iron Co. has placed in commission 60 of the 120 Semet-Solvay by-product coke ovens at its new $6,000,000 plant at North Birmingham. The other batteries will be in operation within a few weeks. The Sloss-Sheffield company will shortly abandon the four batteries of bee-hive ovens, at its City Furnace plant, which were built in 1882, and have been in almost constant operation for the past 38 years, being an old landmark of the city.

Morris W. Bush, who is president of the Alabama By-Products Corporation, and also of the Birmingham Coke & By-Products Corporation, made the following announcement of the transfer of the property: "The Alabama By-Products Corporation has acquired the property and business of the Birmingham Coke & By-Products Co. The Alabama By-Products Corporation will make coke, ammonium sulphate, tar and benzol, using the recently completed plant of 50 Koppers ovens of the Birmingham company. It will also engage in other lines of industry from time to time as may seem desirable."

These Koppers ovens were put in operation about two weeks ago. The work of constructing them began in the fall of 1918, but on account of the delays in the delivery of materials and machinery they have only just been completed.

The plant represents an investment of over $5,000,000.

Middle Western

Midwest Review

Contrary to general opinion, the car supply in southern Illinois coal fields has been much better this week (ended April 24) than last; the mines here probably operating on a 20 to 30 per cent basis, as the average for the week. This is an improvement, however, as the car supply for the week before was only 15 per cent or thereabouts.

All Terminals Embargoed

Practically all of the large terminals here are enbargoed. It was rumored during the middle of the week that the strike of the rebel switchmen had been settled, but this rumor proved a little previous as the deadlock is, at this writing, as tight as ever. Operators, of course, cannot ship their coal to Chicago, Peoria or any other distribution point, but as they have a big market for their coal in the West and South and in a great many rural districts, they are having absolutely no trouble in placing the meager tonnage they are able to produce. What seriously affects the coal industry more than anything else, is that practically all of the terminals are clogged with coal cars, which have been unloaded but cannot be returned to the mines on account of the strike.

Market conditions in the entire Middle West are quite strenuous, and we believe it is no exaggeration to say that coal is harder to get, anywhere in this territory, than it was during the war and when war-time conditions pre-

vailed. The only coal being offered is more or less off-grade stuff, which is practically unsalable in ordinary times when ordinary competition prevails. This coal, by the way, is selling at prices in excess of Franklin County rates.

Duquoin—A new mine is being sunk 11 miles west of here near Cutler, located on the Wabash, Chester & Western R.R., by a company from Mt. Vernon, known as A. Wilson & Sons. The mine will be equipped with modern and up-to-date machinery, including electric mining machines. A new steel tipple will be erected over the main shaft. The mine is to be a large producer, having a capacity of 3,000 tons when fully developed. The Wabash, Chester & Western R.R., which will serve the mine, was recently sold to the Southern Gem Coal Co., and will be put in shape, as it is said that the owners intend to make it one of the foremost coal carriers in southern Illinois.

The Sunnyside mine near Herrin, southeast of here, was completely destroyed recently, following closely on the big disaster two weeks ago which burned the Jackson Coal Co.'s mine at Hallidayboro. However, the Sunnyside fire loss was estimated at $200,000, whereas the Jackson mine fire was only half of this amount. This takes two of the oldest mines in southern Illinois from the list of producers. The origin of the Sunnyside fire is unknown as in the case of the Hallidayboro disaster, and over 500 men are thrown out of work. Close by the tipple were several other buildings, including a large washer, all of which were burned to the ground.

Granite City, Ill.—The first unit of the St. Louis Coke & Chemical Co. plant at this place, comprising 80 coke ovens and one blast furnace, will be in operation about the middle of July, if there is no unexpected delay in the delivery of equipment. The blast furnace (says *Iron Age*) will have the capacity of 500 tons of pig iron per day. The coke plant will handle 2,000 tons of coal per day, and will produce about 1,500 tons of metallurgical coke from 100 per cent Illinois coal. Part of the coke output will be used in the company's own blast furnace.

Springfield—Approximately half of the coal mines in Illinois were reported idle recently and 45,000 miners have been forced out of employment by the strike of railroad switchmen, according to Frank H. Farrington, president of Illinois miners.

Clinton—The Vermillion Coal Co., operating a mine in the Clinton field, has leased 1,700 acres of fifth seam coal land from the United States Steel Corporation, and will sink a mine southwest of Clinton, on the Chicago & Eastern Illinois railroad switch. Bricks for the boiler house are here and steel and boilers are being shipped to the mine site. The Steel Corporation operates the Bunsen mines at Universal, and is retaining a large acreage of its own adjoining the leased tract.

Terre Haute—More Indiana coal mines were reported closed recently because of car shortage than ever before in the history of the Indiana Coal Trade Bureau, which has its headquarters in Indianapolis. There were 101 mines idle in the state. Operators stated that the railroad yardmen's strike was directly responsible for the increase in the car shortage, which has prevailed for several months. Thirty-seven of the closed mines are on the Pennsylvania R.R., 28 on the Chicago, Terre Haute & Southwestern, 16 on the Monon, 15 on the Chicago & Eastern Illinois, and five on the Big Four.

Johnston City—A deal has been consummated in Williamson County whereby the Old Ben Coal Corporation becomes the owner of the Johnston City mine of the Big Muddy Coal Co., known as the P. H. Holland mine. The mine lies adjoining this city and the property includes several hundred acres of coal lands. With the acquisition of this plant, the Old Ben company now has 15 operating mines in the Illinois field, and owns more than 60,000 acres of coal land.

Chicago—The coal industry throughout Illinois has felt the effect of the switchmen's strike on the railroads in no small degree. Due to the fact that the railroads are unable to get shipments through or around the city, the result is that the coal contracted for by firms in and beyond Chicago is held up seemingly indefinitely. This not only ties up cars, of which there is a shortage, but produces a great demand for coal with only feeble means of filling it. Coal men have been able to route but a small portion of their shipments around Chicago, but the pressure caused the following mines in the Springfield district to remain idle a few days: Auburn, Peabody, West, Selbytown, New North and Devereau. The fact that one of the loop belts in Chicago is able to run a small number of regular trains has been the only saving feature in the situation.

Missouri Valley

Des Moines—A number of prominent coal men of this place are interested in the newly organized Consumers' Consolidated Coal Co. This concern is capitalized at $100,000 and took over both the Consumers' Fuel Co. and the Park Coal Co. The following are the officers of the new company: President, F. H. Zook; vice president, E. L. Lloyd; secretary, Ellsworth Lloyd; treasurer, K. G. Carney.

Pittsburg — An almost complete paralysis of the Kansas coal industry is reported. An announcement at the headquarters of the coal operators as to mining operations said that only four steam shovels are at work. No deep mines are working. The report further shows that not more than 300 miners out of 12,000 or more in Kansas are at work. Coal operators stated that the suspension of operations was in protest against the sentencing to jail of Alexander M. Howat, president of the Kansas mine workers, and his colleagues. Union officials neither confirmed nor denied the statement.

Eagle Pass, Tex.—The International Coal Co. of this place announces that it expects to begin the shipment of coal within the next 60 days, or by the first of June. The work of overhauling the plant has been under way for several months, beginning when the mines changed hands. When this development work is completed the property will operate to full capacity. A railroad spur has been built from the Southern Pacific main line to the mines and cars will be loaded direct. Under the old arrangement the coal had been hauled overland from the plant to the railroad. New machinery for handling the coal at the mines has been installed and the plant will be thoroughly modern when this work is completed.

McAlester—Coal miners and operators of District 21, United Mine Workers of America, will meet at this place next week to settle differences growing out of working agreements. A new working agreement covering this district will be negotiated. District 21 embraces Texas, Arkansas and Oklahoma miners. The conference will apply the Washington Coal Commission's awards to the Southwestern fields. The new wage increase of 27 per cent is already being paid.

Western Fields

Gunnison, Col. — Opening of the Muncey hard-coal deposits in the Ragged mountains of western Gunnison County is announced here as one of many development projects to be undertaken in this county this summer. Coal of the same quality has been worked for 40 years in the Smith anthracite mine, and in the Peanut mine at the Buttes. It will be opened at another point there this summer through the General Pershing mine of the Colorado Fuel & Iron Co. The Ruby anthracite mine near Crested Butte has also been worked for many years, but the larger deposits, known as the Muncey banks in the depths of Dark canyon and on the western fringe of the Ragged mountains, has never been carried farther than the prospecting stage. In the early 80's parties patented hard-coal claims here.

Billy Muncey, a character of early days in western Colorado, who had been an express rider in and out of Salt Lake City, made the first discoveries in Muncey basin in 1880. Here he patented 320 acres and later acquired the Tuscarora claims of 640 acres, several miles west, near the McClure Pass between Somerset and Marble.